THE COMPARATIVE EFFECT ON INTELLIGENCE TEST SCORES OF NEGRO AND WHITE CHILDREN WHEN CERTAIN VERBAL AND TIME FACTORS ARE VARIED

By

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CHAPTER I

INTRODUCTION

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The problem of differences in intellectual functioning levels of individuals and of groups has been of concern to educators and psychologists for many years. Nowhere, it seems, has this problem been more acute or puzzling than in the area of racial differences. In the American culture many pages have been written concerning the comparisons of the native intelligence of Negroes and whites. A major area of difficulty has been that of the accurate assessment of intelligence in order that valid comparisons could be made. Perhaps the most widely used assessment instruments have been the standardized intelligence tests. Since different intelligence tests have yielded differences in scores between whites and Negroes, many authorities have attempted to explore the causes for these differences.

Shuey and Kilpatrick have maintained a position supporting a biological or genetic explanation as to these observed or tested differences. Shuey, after presenting the results of approximately 170 studies of Negro intelligence testing over a forty year period, concludes:

> The remarkable consistency in test results, whether they pertain to school or preschool children, to high school or college students, to drafts of World War I or World War II, to the gifted or the mentally deficient, to the delinquent or criminal; the fact

> that the colored-white differences are present not only in the rural south and urban south, but in the border and northern areas; the fact that relatively small average differences are found between the IQ's of northern-born and southern-born Negro children in northern cities; the evidence that the tested differences appears to be greater for abstract than for practical or concrete problems; the evidence that the differences obtained are not due primarily to a lack of language skills, the colored averaging no better on non-verbal tests than on verbal tests; the fact that differences are reported in all studies in which the cultural environment of the whites appeared to be no more complex, rich, or stimulating than the environment of the Negroes; the fact that in many comparisons (including those in which the colored appeared to best advantage) the Negro subjects have been either more representative of their racial group or more highly selected than have the comparable white subjects; all point to the presence of some native differences between Negroes and whites as determined by intelligence tests (37:318).*

Kilpatrick states:

> ... as far as our knowledge of the problem goes, the improvement in the social and economic opportunities have only increased the differences between Negroes and whites. This is because such improvements have been given to both racial groups - not only to the Negro - and the whites have profited the more from them. This serves to emphasize the former statement that a fruitful approach to racial equality cannot follow the lines of social and economic manipulation. There is something more important, more basic, to the race problem than differences in external opportunity (26:82).

Conversely, many authors (1, 2, 6, 9, 10, 11, 13, 17, 22, 23, 28, 29, 30) have preferred to support a position involving educational, environmental, or cultural deprivation, or some combination of the three, as the cause of the relatively poor scores of Negroes when compared to whites on instruments designed to measure intelligence. After examining various studies involving differences between races, Anastasi concludes:

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*Numbers within parentheses indicate references cited in the Bibliography.

> The large majority of studies on race differences provide only descriptive data, with no information regarding the causes of the observed behavioral differences. The historical contribution of different races to science, literature, art, and other cultural developments can be more readily explained in terms of environmental conditions than in terms of biological differences between populations. Primitive man's skill in responding to slight sensory cues is attributable to learning rather than to sensory superiority. Most investigations reporting race differences on intelligence, special aptitude, or personality tests are difficult to interpret because of the complex operations of cultural differentials (1:598).

Havighurst and Neugarten also state:

> Most anthropologists and psychologists now believe that there is no innate difference in intelligence between racial or ethnic or religious groups. There are innate differences between individuals within these groups, but the average intelligence of the groups is the same, it is thought, if the groups have equal opportunity and similar training in solving the ordinary problems of life. ... Such group differences as are found in studies based on intelligence tests are believed to result from several factors - differences in experience with particular types of problems that made up the test, differences in motivation to do one's best on the tests, and possibly differences in experiences during the preschool years (22:236).

Klineberg takes this point of view:

> It is now recognized that the intelligence tests do not in themselves enable us to differentiate safely between what is due to innate capacity and what is the result of environmental influences, training, and education. Wherever it has been possible to make allowances for differences in environmental opportunities, the tests have shown essential similarity in mental characters among human groups (29:25).

In a later article, Klineberg restates his position, "I can only conclude that there is no scientifically acceptable evidence for the view that ethnic groups differ in innate abilities" (27:202).

Concerning the broad use of intelligence tests in schools, Thorndike and Hagen state:

> Among the most thoroughly explored and widely used aptitude tests are tests of intelligence. As these have been developed, they tend to emphasize abstract intelligence, the ability to deal with ideas and symbols, and may even be thought of as scholastic aptitude tests (38:256).

They also state, however:

> An IQ of 90 has a rather different meaning for a Negro child who spent his early years in a sharecropper's cabin in the rural south from what it has for the son of the local banker (33:252).

Kenneth Eells takes issue on the "validity" of intelligence tests with certain subcultural groups. After writing on the importance that has been attached to intelligence tests scores in public schools, he states:

> Are these "intelligence" tests valid? Do they really measure what those who use them think they measure? In particular, are they satisfactory measures of the "intelligence" of children from widely varying cultural backgrounds? The question of the fairness of our present intelligence tests is one of great importance, both to the individual pupils and to society as a whole. If, as many competent educators, psychologists, and sociologists believe, the intelligence tests are really unfair to children from certain kinds of backgrounds, and do not reveal the full abilities of these children, then grave injustices are done to such children when school people base curricular, instructional, and guidance practices on the IQ as determined by such tests. Moreover, a serious loss to society may result through failure to identify and develop the real talents of all its members. No democratic society in today's world is in such a secure position that it can afford to waste,

> through nonrecognition, the leadership or other talents of any large group of its people (17:3).

The importance of understanding the differences between intelligence test scores in relation to what these test scores may or may not indicate has become a matter of general concern to educators in recent years. This problem has become even more acute as greater and greater numbers of Negro and white children attend the same schools. The importance of the problem to those concerned with educational placement and/or vocational choice of students as well as the aforestated dichotomous views of various authors provided the rationale for this study.

Purpose of This Study

Among the various factors that may contribute to intelligence test score differences are those of verbal response and timed or "speed" tests. While some authors (1, 2, 17, 20, 23, 25, 28, 33) indicate that verbal factors may discriminate unfairly against Negro and other subcultural groups, some of the same authors and others (1, 2, 10, 11, 17, 20, 31) indicate that time or speed factors in intelligence tests may discriminate against certain ethnic or socioeconomic groups.

This study was designed to answer the following questions:

1. When three different individual intelligence tests which vary in verbal and time factors are administered to selected samples of white and Negro children of both sexes, ages nine years and six months to ten years and six months, how do their performances compare?

2. Are there differences in performance related to sex or race?

3. Do these differences change with verbal and time variations from test to test?

4. What are the correlations among subtests and total scores?

5. Do these correlations vary by race or by sex?

The three intelligence tests chosen to accomplish these variances in verbal and time factors were the Wechsler Intelligence Scale For Children (WISC), the Peabody Picture Vocabulary Test (PPVT), Form "B", and the Columbia Mental Maturity Scale (CMMS), 1959 Revision.

The WISC was chosen because of its emphasis on both verbal response and speed. It is composed of five Verbal Tests (Information, Comprehension, Arithmetic, Similarities and Vocabulary) with a Digit Span test possible as an alternate, if necessary. The Performance Tests of the WISC consist of five additional tests (Picture Completion, Picture Arrangement, Block Design, Object Assembly and Coding) with an alternate test of Mazes, if necessary. The five Verbal Tests used (excluding Digit Span) are scored two, one or zero dependent upon the child's ability to respond orally in an acceptable manner. The Arithmetic subtest is "timed" in that a time limit is set on each of the sixteen individual questions. The Performance Tests (excluding Mazes) are all scored on the basis of time (the faster a child performs a given task, the higher the number of points he scores for that item) with the exception of Picture Completion, which is untimed. By using the tables provided in the manual, the test yields a Verbal IQ (VIQ), a Performance IQ (PIQ) and a Full Scale IQ (FSIQ) (40).

The PPVT was chosen because it is untimed, but maintains the verbal factor, even though the verbal factor is varied somewhat in comparison to the verbal responses required on the WISC. The assumption that there is a difference in the type of verbal conceptualization required of the WISC and the PPVT was based upon the earlier study of Carson and Rabin. They used the Full Range Picture Vocabulary Test to equate the "comprehension level" of thirty northern Negro, thirty southern Negro and thirty northern white children. They then administered, to these same children, the WISC Verbal Scales to find the "communication level" of the three groups and concluded:

> ... it should be pointed out that verbal comprehension and verbal communication seem to be two different functions. Although the groups were equated on comprehension, they showed marked differences with respect to communication. The former required recognition within a given context, which is quite different from verbal communication and definition of a word in isolation and not in context. It would appear that differences between Negroes and whites on conventional intelligence tests, and especially on vocabulary subtests, may be primarily due to the failure in verbal communication rather than in comprehension (8:51).

The PPVT consists of 150 sets of drawings, four pictures comprising each set. A word is given orally to the child by the examiner and the child may point to or give the number of the picture in the set which most closely approximates the word. Raw scores may be converted to MA's, IQ's and percentiles by using the tables provided in the manual (16).

The CMMS is an untimed, performance test used as a further variance of verbal and time factors in the study. This test consists of 100 cards, six by nineteen inches, with three to five drawings on each card. The child is requested to indicate which of the figures is "different" or "does not belong with the others" (7). The raw scores are converted to MA's in the manual.*

These test results were examined for significant differences among tests, between sexes and between races. It was hoped that findings would be useful to school personnel who provide information basic to wise educational decisions for children from different socioeconomic and ethnic backgrounds.

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*Revised norms (1959) are available in printed form on a single sheet from World Book Company, New York.

CHAPTER II

REVIEW OF THE LITERATURE

The literature reviewed for this study consisted of a survey of three different but allied areas: first, studies surveying previous results and comparisons of white and Negro testing; second, research directed toward the three instruments involved in this study (WISC, PPVT, CMMS); and third, writings by various authors indicating that verbal and time factors may play a part in the obtained differences on test results of Negro and white children.

Studies Concerned with Explaining or Demonstrating the Differences Between Test Results of Negro and White Children

Shuey reviewed thirty investigations involving Negro school children in which nine individual intelligence tests were used: the WISC, Stanford-Binet (Forms L and M), Pintner-Patterson Scale of Performance Tests, Kohs Block Design Scale, Arthur Point Scale of Performance Tests, Full Range Picture Vocabulary Test, Detroit Learning Aptitude, David-Hess Test and the Stanford Revision of the Binet-Simon Tests, 1916 Form. The total number of children included in the studies was 6,337. Eighteen of the thirty studies included white as well as Negro children. In only one of the studies did the Negro mean IQ equal that of the comparative white group mean IQ. In regard to seventeen of the thirty studies in which Negro children were selected at random, Shuey states:

> The average IQ of these Negro children in the southern cities of Atlanta, Austin, Nashville, and New Orleans approximates 83; the average IQ of the colored Ss in the border cities of Oklahoma City and Kansas City is about 89; the average IQ of the colored in the northern cities of Lawrence, New York, Philadelphia, and Youngstown is approximately 86 (37:45-46).

Dreger and Miller cite the extensive studies of McGurk to indicate that even though socioeconomic factors were closely controlled, the comparison indicated that "the mean scores of white and Negroes differed significantly in the direction usually reported" (13:366). They further report that any search for a "culture free" test is "illusory" (13:368).

Jenkins reviewed thirteen studies conducted in northern metropolitan areas which included 22,301 school and college Negro students. He found that those Negro students scoring at IQ 130 or above compared favorably with percentages expected from a normal population sample. He stated, ".03 per cent scored at IQ 140 and above, and fully 1 per cent scored at IQ 130 and above" (24:323).* Myrdal (35) cited the comparative studies of World War I to indicate that Negro recruits from four northern states scored significantly higher on intelligence tests than did white recruits from four southern states.

Klineberg, in a recent review, noted the studies of Anastasi and d'Angelo, using the Goodenough Draw-a-Man Test, to indicate that no significant differences were found between Negro and white preschool children. Klineberg also reviewed the studies of W.W. Clark in Los Angeles, the Washington D.C. studies of desegregated elementary schools, and the studies in Louisville, Kentucky to indicate that, "when the environment improves, test scores go up" (27:200-201).

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*Using deviation IQ's from the Stanford-Binet, the top one per cent would be above IQ 137 and the top .03 per cent would be above IQ 156.

In general, the studies reviewed and especially those covering a wide span of comparative studies (1, 13, 37) in this area, indicate a lowered intelligence test performance by Negroes when compared to whites; however, certain comparisons have demonstrated opposite findings and the problem of explaining causation of found differences remains a subject of debate.

Studies Related to the Instruments Used in This Study

As stated previously, the Wechsler Intelligence Scale for Children (WISC) (39, 40) was used in this study as a highly verbal and heavily time factored instrument in comparison to the Peabody Picture Vocabulary Test (PPVT) (16) and the Columbia Mental Maturity Scale (CMMS) (7).

WISC

Shuey refers to the study of Young and Bright using the WISC with southern rural Negroes. They tested 81 Negro children between the ages of ten and thirteen and reported a mean IQ for the total group of 67.74. The authors noted that "the test itself ~~was found to~~ be unsuitable for southern rural Negro children" (37:39). Dreger and

Miller (13) refer to the Young and Bright study reported by Shuey and record the same findings and conclusions. They further report the studies of Caldwell in using the WISC with Negro children and noted that while Young and Bright found a mean of 67.74 for southern Negro children, Caldwell found a Full Scale IQ of 85.52, even though Caldwell's Negro sample (N = 420) still scored considerably below the white standardization group.

Several authorities (2, 20, 38) on testing write in a favorable manner concerning the WISC. Anastasi states:

> On the whole, the WISC compares favorably with the more recently developed WAIS [Wechsler Adult Intelligence Scale] in the quality of its test construction procedures. The size and representativeness of its normative sample and the careful procedures followed in determining reliability set a particularly high standard in test development. The dearth of validity remains its principal weakness. More attention should be given to the consistent discrepancies between WISC and Stanford-Binet IQ's at different ages and intellectual levels (2:320).

Thorndike and Hagen compare the WISC and the Stanford-Binet. They state:

> The ultimate basis for choice will be the validity of the inferences that can be made from each in the situation in which they are actually used. Prediction of academic success can apparently be made about equally well from either test [WISC or Stanford-Binet]. It seems likely that the two tests are about equally useful for children with mental ages of 7 or above (38:231).

However, Freeman (20) questions the cultural fairness of the verbal subtests and the factor of speed with some subcultural groups. Anastasi (2) notes that socioeconomic and urban-rural differences in subtest profile have been found and refers to the fact that the standardization group included white children only.

Bradway and Thompson (4) and Bradway and Robinson (5) report that in the twenty-five year period, between 1935 and 1960, significant changes in IQ were found between preschool intelligence quotients and those found for the same group at adulthood, especially in males. They caution psychometrists and psychologists that a prediction of future intelligence should be shaded somewhat in the direction of the general family level of intellectual ability. However, Estes (19) found that the socioeconomic level of children at age seven and one-half was a factor in WISC intelligence test performance, but at age ten and one-half, with the same children, the socioeconomic factor had no significance (18).

PPVT

The PPVT, used as the second instrument in this study, was standardized on 4,012 cases from age two years, six months to eighteen. It was chosen as the intermediate instrument in this study because of the following:

1. the test has high interest value and is therefore a good rapport establisher;
2. extensive specialized preparation is not needed for its administration;
3. it is quickly given in ten to fifteen minutes;
4. scoring is completely objective and quickly accomplished in one or two minutes;
5. it is completely untimed and thus is a power rather than a speed test;
6. no oral response is required (16:25).

The author of the PPVT states:

> The Peabody Picture Vocabulary Test is designed to provide a well standardized estimate of verbal intelligence through measuring his hearing vocabulary (16:25).

Norris, Hottel and Brooks (36) found that test-retest reliabilities on the PPVT remained high even when administered to groups, while Dunn and Brooks administered the PPVT to 341 mentally retarded students in the public schools in and around Nashville, Tennessee. Concerning this study they state:

> Since a pointing response is required rather than an oral one, it [PPVT] is especially appropriate for subjects who have speech difficulties or are extremely withdrawn. Since no reading is required, it has advantages in testing children who are inferior or non-readers. Since the test is untimed, it is especially suited for slow subjects and those who have multiple handicaps (14:35-36).

Dunn and Harley compared the PPVT, the Ammons Full Range Picture Vocabulary Test, the Van Alstyne and the CMMS with a group of twenty cerebral-palsied children. They state:

> The alternate form reliability coefficient was found to be .97 for the PPVT and .86 for the Ammons. Intercorrelations between sets of mental age scores on the four tests were all found to exceed .80. However, picture vocabulary test scores correlated more closely with one another than with the Columbia, indicating, as was expected that the latter may be measuring different intellectual factors than the vocabulary scales (15:74).

CMMS

The CMMS was chosen in order to produce a further variation in verbal and time factors. Developed for use with cerebral-palsied children, the test does not require reading, writing, oral response or "hearing vocabulary" and is untimed. While much of the experimental work with this instrument has been done with cerebral-palsied children, Barrett (3) found the correlations of the CMMS with the WISC to range from a high of .600 with the Arithmetic subtest on the WISC to a low of .272 with the Digit Span subtest. The correlation between CMMS and full scale IQ scores on the WISC was .606; between CMMS and Verbal IQ, .559, and between CMMS and Performance IQ, .478. From this statistical comparison, he stated that the CMMS was usable with normal children as well as with cerebral-palsied children. In a comparison of the CMMS and the SRA Primary Mental Abilities Test, Mill and Turner relate:

> These r's suggest that the CMMS is most heavily weighted with a measure of reasoning and understanding of ideas. It contains a moderate measure of numerical ability and ability to perceive small details quickly and accurately, and there is a slight measure of space perception (34:472).

Freeman states:

> The Columbia Mental Maturity Scale (1954; revised norms, 1959), designed for the mental age range of three to twelve years, is intended primarily, though not solely, to test mental ability of children handicapped by cerebral palsy or other defects of motor or verbal functioning. Also, like other performance tests, this scale may be used in checking on ratings of linguistically handicapped children who were examined first by tests using verbal materials. The child's response can be restricted merely to pointing, or to pointing plus any verbal additions he wishes and is able to make. ... This technically well conceived scale demonstrates that with children it is possible to obtain a reasonably dependable rating, when necessary, through the use of a single type of material of a sound kind (20:290-291).

Studies Related to Time and Verbal Factors As Possible Causes of Variances in Intelligence Test Scores

As was stated previously, this study was predicated on the assumption that verbal and time factors in intelligence testing might be two of the factors that discriminate against children from certain socioeconomic classes or ethnic group background. Concerning the verbal factor in intelligence testing, one author states:

> In actual practice, the tests of general intelligence are usually overloaded with certain functions, such as verbal ability, and completely omit others (2:189-190).

Herrick, in criticizing the use of vocabulary items on tests of intelligence for certain socioeconomic classes, states:

> Vocabularies of middle-class parents are usually larger and more "correct" by the usual middle-class standards than are the vocabularies of lower-class parents. Furthermore, middle-class parents are more likely to read to their children and to converse with them than are lower-class parents. Hence, middle-class children get vocabulary and grammar training at home which is better by the usual intelligence-test standards of vocabulary and grammar (17:19).

Kennedy, Van De Riet and White in their standardization study of the Stanford-Binet on Negro children in the southeastern United States, call attention to the apparent discrepancy of vocabulary items:

> An item difficulty analysis of the vocabulary test indicated that, as far as this sample [N = 1800] is concerned, several words are misplaced. This misplacement may have resulted in the sample failing at an earlier level than the white normative sample. As this subtest seems to be the most misplaced one on the Binet Scale, it contributes to the lack of agreement between the Negro norms and the original test norms provided by the publishers (25:145).

Freeman in his criticism and evaluation of the Wechsler Scales states:

> As in all tests of information and vocabulary, success on these parts is dependent, in part, upon opportunity to learn, whether in the school, home, or through one's own exploitation of all aspects of the environment (20:267).

The subcultural difference in language is described by Herskovits in what he terms "the process of reinterpretation" (23:555), while Maccoby, Newcomb and Hartley present the work of Brown and Lenneberg, who state:

> The differences between languages suggest that people speaking different languages must experience the world in different ways. It appears that "culture" includes, in addition to values and technology and religious practices, a particular cognitive structure. Children acquiring their first language learn more than a set of vocal skills; they take on the world view of their group. There are innumerable linguistic contrasts that suggest interesting cognitive differences. We offer here two examples, a difference in phonology or sound system and a difference of vocabulary (33:10).

As to the "time factors" involved in this study, and their possible discriminatory function in tests of intelligence, different authors cite varying types of research. Anastasi refers to the work of Klineberg in the late 1920's involving the "role of speed" in intelligence tests. Klineberg, comparing Indian, white and Negro school boys, using tests in the Pintner-Patterson Performance Scale, found that speed was a definite factor in test performance. In regard to Klineberg's study, Anastasi states:

> In *accuracy* of performance, as measured by the number of errors on each test, the Indians excelled the whites, and the Negroes were either equal or slightly superior to the whites. All measures of *speed*, on the other hand, favored the whites. A comparison *of the same race but living in different environments* suggest that these differences in speed were cultural rather than biological (1:551-552).

Davis, addressing himself to the various "phenomena" that enter into a child's response to a test item, lists "speed" as a discriminatory factor:

> The phenomena of "speed", which are complex functions of the hereditary factors, the physical condition and stamina of the testee at the particular time, his cultural habits of work, his familiarity with the cultural form and content of the problem and his previous experience or training with this specific type of problem (17:26).

LeShan in his study of child-rearing practices in various socioeconomic classes, found significant differences in "personal time orientation in different social classes" (31:529).

Lott and Lott (32) provide evidence to indicate that subcultural environment effects "motivational differences" of Negro students toward "education" and certain "aesthetic values", while Clark (10) indicates that culturally deprived children may have an entirely different attitude toward most school activities and also those activities associated with the white middle class value system. Clark indicates that the subcultural milieu plus the effects of isolation and segregation result in widespread and various personality maladjustments. He states:

> Personality damage associated with these social pressures is found among all children subject to them, without regard to racial, nationality, or religious background (11:63).

Anastasi notes that there may be a wide cultural variance of effect upon development:

> The particular culture in which the individual is reared may influence his behavioral development through many channels. The operation of environmental forces is not limited to the extent and quality of educational opportunities available in the school, the home, and the neighborhood. The question is not one of amount, but of kind. The experiences of people living in different cultures may vary in such a way as to lead to basically different perceptual responses, lend a different meaning to their actions, stimulate the development of totally different interests, and furnish diverse ideals and standards of behavior (1:550).

In the light of the research presented above, this study and design was based on the following assumptions:

1. There are widely varying postulates made by various test authors with respect to the most effective means of measuring intelligence and to the meaning and significance of test results.

2. Among the factors that may discriminate unfairly in intelligence testing when applied to certain groups and individuals are those of "time" and/or "speed" and the loading of the test with verbal concepts, verbalization and acceptable verbal responses.

3. These time and verbal factors, regardless of their control, may or may not work independently of many other cultural factors including motivation, inferiority feelings, hostility and educational lag or deprivation.

4. There does not exist at present a "culture-free" test, and there is no completely "nonverbal" test to the extent that verbal conceptualization is completely eliminated.

5. The concepts underlying intelligence tests are primarily based upon the ethnocentric values of a white, middle-class culture and educational system and do not include elements of subcultures nor aspects of the possible variance in conceptualization that a subcultural environment may produce.

6. It may be possible by comparison of test variables to isolate some of these cultural factors and to draw significant, operative suggestions for those whose duty it is to use tests of intelligence for purposes of planning individual programs and placing or grouping children.

7. It is possible to explain differences between scores on intelligence tests by noting that these differences may exist between groups and individuals both culturally and biologically.

CHAPTER III

THE DESIGN AND PROCEDURES

Three steps were used in developing the design for this study and in determining the procedures to be followed in collecting and analyzing the data: first, the selection of Negro and white subjects; second, establishing test administration procedures as well as recording and compiling test results; third, analyzing statistically the data for comparative purposes.

Selection of Subjects

A group of third- and fourth-grade Negro children (twelve boys and thirteen girls) between the ages of nine years six months and ten years six months, whose formal education had taken place entirely in the Negro elementary schools of Alachua County, was chosen from the Duval Elementary School of Alachua County, Florida. The selection of the particular school was determined by a conference with the Guidance Director of the Alachua County Schools. Students in the Duval Elementary School are representative of a southern, urban community of medium size,* with approximately one-fifth of the community being Negro.+

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*Population of Gainesville, Florida is an estimated 49,000 based upon 1960 census figures plus annexation figures since 1960. The information was obtained from the Bureau of Economic and Business Research, College of Business Administration, University of Florida.

+Chamber of Commerce, Gainesville, Florida

The age group was chosen on the basis of the particular age at which reliability coefficients for the three instruments used (WISC, PPVT and CMMS) were the highest possible for any age group of elementary school children. The three test authors report reliability coefficients of .77 (PPVT), .92 (CMMS) and .95 (WISC) for age ten years. To insure a significantly large sample from one school, a chronological age spread of one year was selected. The rationale for selecting only those children who had obtained their entire formal schooling in the Alachua County Schools was based upon the desire to avoid a large variance in school experience and to insure the availability of a relatively complete student record for the period of attendance in school. Third- and fourth-grade pupils were used because pupils in these grades, who have made normal progression in school, would include the chronological age range chosen for this study and described above.

Permanent record folders were scrutinized for each child to confirm the date of birth, substantiate previous schooling, and to gather as much background information on the child as possible. This background information included previous testing data, parental occupation and educational level, number of siblings, home ownership and teachers' assessment of socioeconomic class. A total of twenty-six girls and nineteen boys were found in the Duval Elementary School who met the requirements of age, sex, grade and educational background.

At the suggestion of the principal of the school, a letter was sent to the parents or guardian of each child requesting permission for the inclusion of their child in the study (Appendix A). A two-week waiting period was designated as ample time for parental consent letters to be returned. A total of nineteen girls and fourteen boys were given parental permission to participate in the study by returning the letters to the school. From this total, a random selection table* was used to select the twelve boys and thirteen girls.

A white comparative group was selected from the Kirby-Smith Elementary School, Alachua County, Florida. The selection of school was made on the basis of this school's representing a white elementary school in a medium sized southern community. A further consideration was given to the Kirby-Smith School because of its larger size in comparison to the Duval Elementary School. This difference in size was seen as an assurance that more white students meeting the criteria of age, sex and grade would be available for selecting the comparative group. Using the same selection procedures as those described above for the Duval Elementary School, it was possible to find forty-two girls and thirty-eight boys in the Kirby-Smith School who met the requirements of grade, sex, age and continued attendance in Alachua County Schools. The parental consent letters (Appendix A) yielded a total of twenty-eight girls and twenty-four boys who were granted permission to participate in the study. A matching procedure was followed for choosing the white comparative group rather than the random selection method used for the Negro children. The writer was thus able to match the mean chronological ages of the Negro and white groups.* The grade level and sex were individually matched for the Negro and white samples. No attempt was made to equate the two groups on the basis of socioeconomic class; however, intergroup comparisons were made on the basis of cited research and permanent record information.

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*From Table XI, pages 280-281, Walker and Lev, Elementary Statistical Methods. Henry Holt and Company, New York, 1958.

Testing Procedure, Scoring and Compiling the Data

Each child in both the Negro and white groups was assigned a test number which was used throughout the testing administration, scoring and recording procedure. Each Negro child was assigned a school letter (A), a number (1 to 12 for boys, 13 to 25 for girls) and a sex-identification letter (B or G) for boy or girl. This, then, indicated that "A-1-B" represented the first Negro boy tested, while "A-25-G" represented the last Negro girl tested. Each white child was assigned a school letter (B), a number (1 to 12 for boys, 13 to 25 for girls) and a sex-identification letter (B or G) for boy or girl. "B-1-B" represented the first white boy tested, while "B-25-G" represented the last white girl tested. By using a test number for each child, it was possible to record the name of the child on the "Personal Data Sheet" only (Appendix B), and the confidentiality promised the parents was assured.

All Negro children were tested first, between March 16 and April 14, 1964, in order to avoid any difficulty in matching should a child for any reason (sickness, withdrawal, transfer or extended absence) not be included in the sample. Also, this method of testing was used in order to avoid disrupting classes for any greater length of time in one school than was absolutely necessary. All testing was done with each child, at the school, in two separate sessions with one session set aside for the administration of the WISC and the other for the administration of the PPVT and CMMS. The two sessions were structured to avoid the possibility of fatigue becoming a factor in the testing of each child.

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*The total of the ages of the Negro and white girls was the same. The total of the ages of the Negro males was four months more than the total of the ages of the white males.

The total white comparative group was tested between April 15 and May 15, 1964. As was done with the Negro sample, the white children were tested at the school in two separate sessions, the WISC being administered at one session and the PPVT and CMMS at the other.

Both Negro and white children were tested in afternoon sessions only. This was done at the request of the principals of the two schools (Duval Elementary and Kirby-Smith Elementary). This made possible a minimum interruption of the school program and also provided a testing room which was not available in the Negro school during the morning hours due to the activities of personnel services specialists or other school needs.

All testing was carefully controlled so that no child in either group passed from one chronological age to another between sessions. All instruments were administered and scored by the writer to avoid any possible variances that might occur with two or more examiners.

During the process of scrutinizing the permanent record folders of both the Negro and white groups, it was possible to find achievement test scores (Stanford Achievement Test, Elementary Battery) for all children of both groups. The Negro third- and fourth-grade classes had been administered the Stanford Achievement Test during the month of October, 1963. The white sample had been tested in September or October of 1963. These test scores were recorded for each child and means were computed for sex, race and grade to provide comparison of achievement level of both groups on a standarized achievement test. It was noted that the Negro group was functioning on an achievement level approximately one year below grade level, while the white group was functioning at or slightly above grade level (Appendix C). Familial information was compiled for each child and this pertinent information was charted for examination and possible comparison between individuals and between groups (Appendix D).

Much has been written concerning the effects on intelligence test scores of Negro children when tested by a white examiner. Shuey examined twenty-three studies of Negro school children in which the examiner was Negro. She concludes, "There is no evidence that the race of the examiner materially affected the testing rapport" (37:316). Anastasi examined the study by Canady as well as the "longitudinal study" done by Pasamanick and Knoblock with Negro pre-school children and stated that "there is also evidence that the presence of an examiner of a different racial or cultural group may interfere with rapport during test administration and thus lower the subjects' test performance" (1:562). With regard to these statements, permanent record folders of Negro children were especially reviewed for any previous individual testing information. Of the total twenty-five Negro children included in this study, four (one boy and three girls) had been tested previously by a Negro female psychometrist, using the WISC. Two of the four children (girls) had been given the WISC Verbal Scales only, while two had been given the total WISC. In all four cases, the IQ's reported by the Negro psychometrist were from one to five points lower than the Verbal IQ or Full Scale IQ found on the WISC in this study. All four Negro children had been tested at least eight months previous to the time of this study. In an interview with the Negro psychometrist, the writer was informed that in previous situations, involving Negro children not included in this study, other white psychometrists or school psychologists had found approximately the same results. In order to further determine the extent of the effect of a white examiner with this Negro sample, the order of administering the three instruments (WISC, PPVT, CMMS) in testing both Negro and white groups was varied. The WISC was administered at the first testing session to six boys and seven girls, while the PPVT and CMMS were administered at the second session. The PPVT and CMMS were administered first to six boys and six girls and the WISC was given at the second session. The reason for alternate testing was to determine if the order of administration of the test would affect the test scores. Using the _t_-test technique for determining differences between means of small groups (12), it was found that no differences existed between the means of the two tested groups at the .05 level of significance. While this information can hardly be projected into the "Negro child - white examiner" controversy, it did provide some indication that this writer's rapport with Negro children was "good."

Treatment of Data

Test scores were recorded for every Negro and white child on each of the three instruments used. Means were computed for sexes and racial groups and are presented in Appendix E.

CHAPTER IV

ANALYSES OF DATA AND FINDINGS

Three different approaches were used in analyzing the data obtained in this study. The first was a graphic comparison of mean and median IQ scores for races and sexes, and for races only. The second was to establish the significance levels of differences between racial groups, between sexes and within the racial groups by use of an analysis of variance technique (12). A third method of comparing test results was to intercorrelate fifteen different test scores by use of the Pearson Product-Moment method of correlation (21). These correlations were computed for white males, white females, Negro males and Negro females in order to further examine the differences in test results of the race-sex samples.

Graphs of Mean IQ Scores and Median IQ Scores

Five IQ scores were available for comparison from the three instruments used (WISC, PPVT, CMMS). The WISC provided a Verbal IQ, a Performance IQ and a Full Scale IQ, while the PPVT converted raw scores to IQ scores by use of tables presented in the manual (16). The CMMS provided only a MA score from the raw score; however, the IQ was obtained by using one of the more common methods of conversion

(IQ equals the decimal ratio of MA divided by CA times 100).*

Figure 1 represents a graphic plot of mean IQ scores for white males, white females, Negro males and Negro females on the basis of the five IQ scores available from the tests used in this study. White male mean IQ scores were: WISC Verbal IQ, 115.5; WISC Performance IQ, 109.3; WISC Full Scale IQ, 113.7; PPVT IQ, 112.4; and CMMS IQ, 89.7. White female mean IQ scores were: WISC Verbal IQ, 101.4; WISC Performance IQ, 97.9; WISC Full Scale IQ, 99.9; PPVT IQ, 99.2; and CMMS IQ, 84.6. Negro male mean IQ scores were: WISC Verbal IQ, 91.4; WISC Performance IQ, 86.1; WISC Full Scale IQ, 87.8; PPVT IQ, 82.9; and CMMS IQ, 75.1. Negro female mean IQ scores were: WISC Verbal IQ, 86.3; WISC Performance IQ, 87.3; WISC FSIQ, 85.3; PPVT IQ, 71.8; and CMMS IQ, 74.9 (Appendix E). It should be noted from Figure 1 that the white males outscore the white females on all five IQ scores while the Negro males outscore the Negro females on all tests except the Performance IQ of the WISC. Also, the CMMS scores cause a clustering of the mean IQ's of the four groups, but represent a considerably lowered score for the four race-sex groups with the exception of the Negro females, whose mean IQ was raised approximately three IQ points as compared to their mean IQ on the PPVT.

Figure 2 represents a graphic plot of the mean IQ scores of the Negro and white samples. The total white group mean IQ scores were: WISC Verbal IQ, 108.2; WISC Performance IQ, 103.4; WISC Full Scale

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*IQ's were obtained by using The Bowman IQ KAlculator. Personnel Press, Inc. Princeton, New Jersey, 1957.

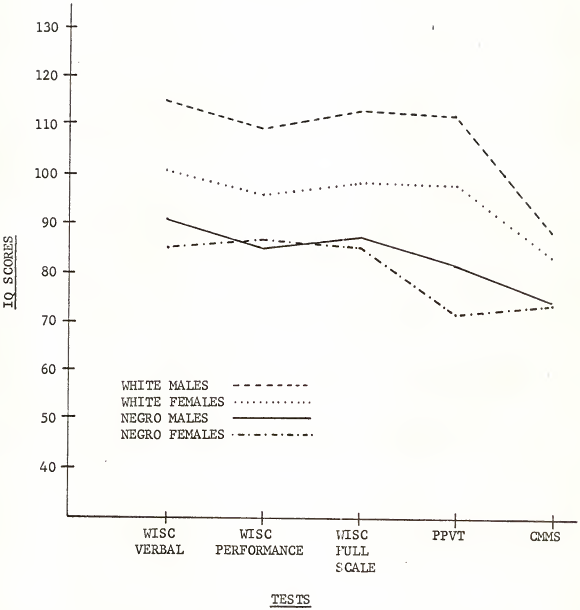
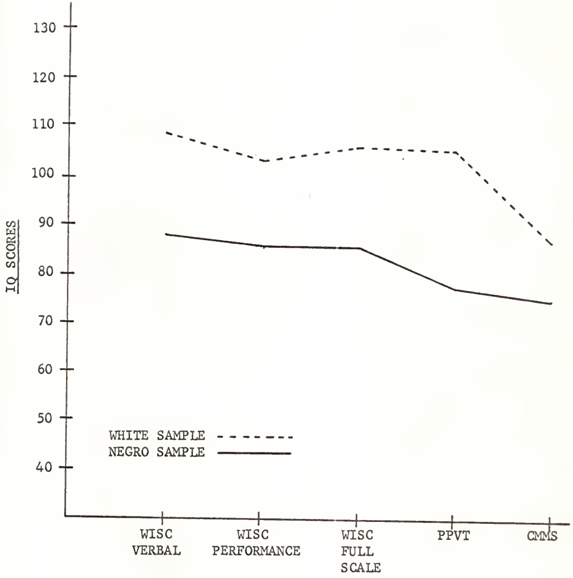


Figure 1. - Graphic comparison of mean IQ scores on WISC Verbal IQ, WISC Performance IQ, WISC Full Scale IQ, PPVT IQ and CMMS IQ for white males, white females, Negro males, and Negro females.



TESTS

Figure 2. - Graphic comparison of mean IQ scores on WISC Verbal IQ, WISC Performance IQ, WISC Full Scale IQ, PPVT IQ and CMMS IQ for the total Negro sample and the total white sample.

IQ, 106.5; PPVT IQ, 105.5; CMMS IQ, 87.0. The total Negro group mean IQ scores were: WISC Verbal IQ, 88.7; WISC Performance IQ, 86.7; WISC Full Scale IQ, 86.5; PPVT IQ, 77.2; and the CMMS IQ, 75.0 (Appendix E). This comparison of racial group IQ scores indicated the generally reported difference between Negro and white groups; however, it should again be noted that the CMMS scores brought the means of the two groups into closer proximity (12 IQ points) even though these mean scores represent a lower score for both groups in comparison to the WISC and PPVT IQ's. The white sample maintained a relatively equal mean IQ score on the WISC Full Scale and the PPVT, while the Negro sample has a decided drop (over nine IQ points) from the WISC Full Scale IQ (86.5) to the PPVT IQ (77.2).

Figure 3 represents a plot of the median IQ score of the four race-sex groups (white males, white females, Negro males and Negro females). With a small number of cases included in both the sex-race and racial groups, the median scores were examined as a possibly more accurate indicator of central tendency than the means and also to eliminate the possible broad effect of one or two extremely high or extremely low scores. The median IQ scores for white males were: WISC Verbal IQ, 116; WISC Performance IQ, 107.5; WISC Full Scale IQ, 111.5; PPVT IQ, 111; and CMMS IQ. 86.5. Median IQ scores for white females were: WISC Verbal IQ, 101; WISC Performance IQ, 99; WISC Full Scale IQ, 99; PPVT IQ, 98; and CMMS IQ, 79. The median IQ scores for Negro males were: WISC Verbal IQ, 95.5; WISC Performance IQ, 86; WISC Full Scale IQ, 91.5; PPVT IQ, 82; and CMMS IQ, 75. Median IQ scores for Negro females were: WISC Verbal IQ, 90; WISC Performance IQ, 88;

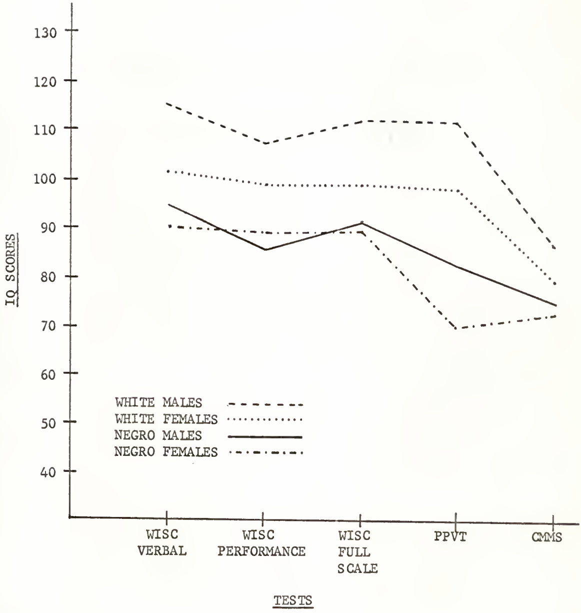
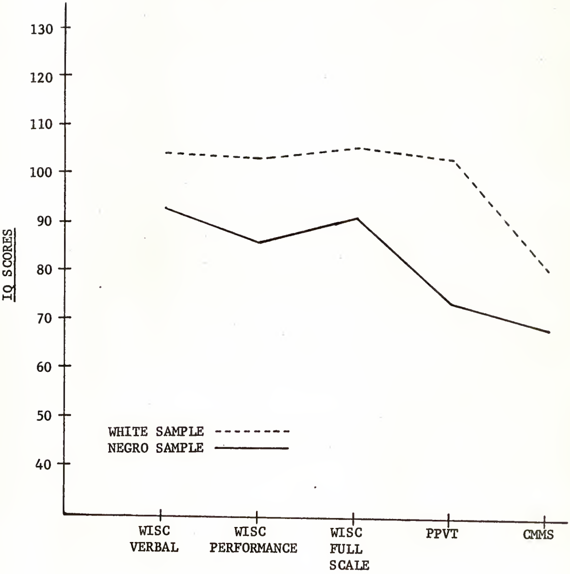


Figure 3. - Graphic comparison of median IQ scores on WISC Verbal IQ, WISC Performance IQ, WISC Full Scale IQ, PPVT IQ, and CMMS IQ for white males, white females, Negro males, and Negro females.

WISC Full Scale IQ, 89; PPVT IQ, 70.5; and CMMS IQ, 73. While some changes in the graph appear in comparison to the mean IQ plot of Figure 1, the same general differences were demonstrated. The white males median IQ scores remained higher than the white female median scores and the Negro male medians remained slightly higher than the Negro females, with the exception of the WISC Performance IQ in which the Negro female median surpassed the Negro male median score by two IQ points. It should be noted that the same clustering of the four race-sex group median IQ scores occurred on the CMMS as that plotted for the mean scores in Figure 1. Also, the drop again occurred for the white males, white females and Negro males, while the Negro female median IQ scores were slightly higher on the CMMS than on the PPVT.

Figure 4 is a graph depicting the differences in median IQ scores for the total white sample as compared to the total Negro sample. Median IQ scores for the white sample were: WISC Verbal IQ, 104; WISC Performance IQ, 103.2; WISC Full Scale IQ, 106; PPVT IQ, 103.3; and CMMS IQ, 80.3. The median IQ scores for the Negro samples were: WISC Verbal IQ, 92; WISC Performance IQ, 86.3; WISC Full Scale IQ, 91; PPVT IQ, 75; and CMMS IQ, 69. The graphic comparison of median scores of the two groups again approximates the same variances in central tendency of the two groups as that shown for the differences in mean IQ's in Figure 2. The median scores held somewhat more consistently for the white group on the WISC IQ's than for the Negroes, while in the comparison of means the reverse was true. The severe drop of the median IQ on the PPVT for the Negro sample was again evident. As with the plot of means in Figure 2, the closest relationship between the



TESTS

Figure 4. - Graphic comparison of median IQ scores on WISC Verbal IQ, WISC Performance IQ, WISC Full Scale IQ, PPVT IQ, and CMMS IQ for the total Negro sample and the total white sample.

median IQ's of the two racial groups was found on the CMMS (11 IQ points), with the rather sharp drop in the white median and a small drop in the Negro median IQ.

Figures 1, 2, 3 and 4 indicate the usually reported difference in both mean and median IQ scores between Negro and white children; however, differences were also found between the sexes within both racial groups and rather sharp declines in IQ score on one or more of the tests led to some question as to the significance of these differences and to questions as to what these instruments actually measure.

Analysis of Variance

In order to establish the significance of the found differences between test scores of the two racial groups, between the sexes, within each racial group, between total female (white and Negro) and total males (white and Negro), an analysis of variance technique was applied to the five IQ scores available in the study (WISC Verbal IQ, WISC Performance IQ, WISC Full Scale IQ, PPVT IQ and CMMS IQ). A p of .05 was used as the criterion for statistical significance.

Table I is the analysis of variance data for testing the significance of differences between scores on WISC Verbal Scales. Employment of an F test resulted in a value of 6.75 for sex. An F ratio of 6.75 is significant at the .05 level of confidence for one degree of freedom (df) in the numerator and forty-six degrees of freedom in the denominator. The F of 27.43 for differences between racial groups is significant at the .01 level of confidence. An F ratio of 1.43 for interaction (sex and race) is not significant at the .05 level of

TABLE I

ANALYSIS OF VARIANCE DATA
FOR WISC VERBAL IQ

SOURCE	SUMS OF SQUARES	df	MEAN SQUARE	F-RATIO	p
Sex	1,162	1	1,162	6.75	$<.05$
Race	4,724	1	4,724	27.43	$<.01$
Interaction	247	1	247	1.43	$>.05$
Within	7,921	46	172.2		
Total	14,054	49			

confidence.

This analysis indicates that on the WISC Verbal IQ for the samples tested in this study significant differences do exist between males (white and Negro) and females (white and Negro), significant differences exist between the Negro and white total groups, but that no significant interaction exists.

Table II is the analysis of variance data for the IQ scores on the WISC Performance Scales. An *F* ratio of 1.41 for sex is not significant at the .05 level of confidence; however, an *F* ratio of 54.27 for racial differences is significant at the .01 level of confi-

TABLE II

ANALYSIS OF VARIANCE DATA FOR WISC PERFORMANCE IQ

SOURCE	SUMS OF SQUARES	*df*	MEAN SQUARE	*F*-RATIO	*p*
Sex	323	1	323	1.41	$> .05$
Race	12,427	1	12,427	54.27	$< .01$
Interaction	2,085	1	2,085	9.10	$< .01$
Within	10,536	46	229		
Total	25,371	49			

dence. Also, in the performance tests of the WISC, there is a significant difference in interaction (sex and race), with an *F* ratio of 9.10 being significant at the .01 level of confidence.

This table was interpreted to indicate that on those elements of intelligence measured by the WISC Performance Scales, the difference between sexes is not significant, the difference between races remains consistent (with the WISC Verbal findings) in that a significant level of confidence exists for the differences in racial groups, and that a difference of an interrelated sort exists between Negro boys and Negro girls and between white boys and white girls in the Performance scales.

An examination of Figures 1 and 3 indicates that Negro girls performed at a higher IQ level than Negro boys on the WISC Performance Scales and the white boys remained consistently higher on the WISC Verbal and Performance Scales than the white girls.

Table III presents the analysis of variance data for comparison of WISC Full Scale IQ's. An F ratio of 4.00 is significant at the .05 level for differences between the sexes (total boys and total girls), while an F ratio of 23.91 indicates again the level of significance (.01) reported for differences between races on the two previous tables. An F ratio of 1.97 for interaction is not significant at the .05 level

TABLE III

ANALYSIS OF VARIANCE DATA
FOR WISC FULL SCALE IQ

SOURCE	SUMS OF SQUARES	df	MEAN SQUARE	F-RATIO	p
Sex	832	1	832	4.00	$<.05$
Race	4,978	1	4,978	23.91	$<.01$
Interaction	411	1	411	1.97	$>.05$
Within	9,577	46	208.2		
Total	15,798	49			

of confidence.

The table was interpreted to indicate that while significant sex and racial group differences are demonstrated on the WISC Full Scale IQ, the differences reported on WISC Performance IQ were eliminated when the Verbal IQ factors were introduced to provide a Full Scale IQ score. It would appear that the WISC discriminates quite definitely in this study between Negro and white groups; the Verbal Scales discriminate between males and females, but do not discriminate significantly when analyzed in terms of the interaction of sex and race, while the Performance Scales do not discriminate significantly between sexes, but do discriminate significantly between girls and boys interactively within a given racial group.

Table IV indicates the analysis of variance data for comparison of PPVT IQ's. An F ratio of 10.05 is significant at the .01 level of confidence for differences between sexes, and an F ratio of 54.71 is significant at the .01 level for race, which again indicated a racial difference of considerable significance. The interaction of sex and race, however, is not significant at the .05 level of confidence.

The interpretation made on the PPVT IQ was that it corresponded closely to the differentiation provided by the analysis of variance on the WISC Verbal IQ (Table I) and the WISC Full Scale IQ (Table III). As they applied to this study, the PPVT, the WISC Verbal Scales, and the WISC Full Scale provided significant differentiation by race and by sex, but not between the sexes within racial groups.

TABLE IV

ANALYSIS OF VARIANCE DATA FOR PPVT IQ

SOURCE	SUMS OF SQUARES	df	MEAN SQUARE	F-RATIO	p
Sex	1,846	1	1,846	10.05	$<.01$
Race	10,052	1	10,052	54.71	$<.01$
Interaction	17	1	17	.90	$>.05$
Within	8,452	46	183.7		
Total	20,367	49			

Table V presents the analysis of variance found for the CMMS IQ. An *F* ratio of .45 is not significant at the .05 level of confidence for sex, nor is the *F* ratio of .40, found for interaction of sex and race, significant at the .05 level. The only significance found was the racial differentiation provided by the *F* ratio of 9.7, which is significant at the .05 level of confidence. This analysis of the CMMS IQ would tend to indicate that it did not significantly differentiate, except by race, in the same manner as did the PPVT and WISC. Further, the CMMS may measure some aspect of intelligence not measured by the WISC or PPVT or it (CMMS) may not measure any aspect of intel-

TABLE V

ANALYSIS OF VARIANCE DATA
FOR CMMS IQ

SOURCE	SUMS OF SQUARES	_df_	MEAN SQUARE	_F_-RATIO	_p_
Sex	84	1	84	.45	$> .05$
Race	1,812	1	1,812	9.7	$< .05$
Interaction	74	1	74	.40	$> .05$
Within	8,613	46	187.2		
Total	10,583	49			

ligence common to either the white or Negro cultures.

Correlation Coefficient Data

In order to further examine intelligence test score differences between Negro and white children, a further statistical analysis of scores was used. While an examination of differences in mean and median IQ's has established that differences existed between the races and between the sexes (Figures 1, 2, 3 and 4), and an analysis of variance (Tables I, II, III, IV and V) established the levels of confidence of these found differences, neither technique indicated what the instruments measure, or, what differences might be found in comparing the race-sex groups on the basis of other tests results available from the study. The third method used to examine these differences was to intercorrelate ten WISC Sub-test raw scores (Information, Comprehension, Arithmetic, Similarities, Vocabulary, Picture Completion, Picture Arrangement, Block Design, Object Assembly and Coding) with mental age (MA) scores on the WISC Verbal Scales, WISC Performance Scales, WISC Full Scale, PPVT and CMMS. Raw scores and MA's were used for correlations to eliminate the chronological age (CA) variable from this examination of test results. Raw scores and MA's* used for correlation purposes are presented in Appendix F for the Negro and white groups. The Pearson Product-Moment Correlation technique was used to provide the correlation coefficients (r). A t test for significance of coefficient correlations for small groups (12) established that for white males and Negro males (N = 12) the degrees of freedom (df) provided for an r of .497 to establish significance at the .05 level of confidence. A correlation coefficient of .658 established a confidence level of .01 for the white and Negro male groups. For white and Negro females (N = 13) an r of .476 was established as the .05 level of confidence, while a correlation coefficient of .634 was established as the .01 level of confidence.

Table VI presents the correlation coefficients between the Information subtest of the WISC and fourteen other test scores for each of the four race-sex groups (white males, white females, Negro males and Negro females). According to Wechsler (39) the Information subtest

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*MA's for WISC Verbal, Performance and Full Scale IQ's were obtained by use of The Bowman IQ KAlculator, Personnel Press, Inc., Princeton, New Jersey, 1957.

TABLE VI

CORRELATION COEFFICIENTS BETWEEN WISC INFORMATION SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Comprehension	.644*	-.084	.751**	.870**
WISC Arithmetic	-.383	.616*	.718**	.675**
WISC Similarities	.081	.133	.700**	.504*
WISC Vocabulary	.388	.256	.819**	.812**
WISC Picture Completion	.517*	-.113	.727**	.449
WISC Picture Arrangement	.602*	.111	.612*	.495*
WISC Block Design	.112	.088	.729**	.491*
WISC Object Assembly	.597*	.232	.684**	.790**
WISC Coding	.155	.226	.506*	.787**
WISC Verbal MA	.644*	.531*	.893**	.852**
WISC Performance MA	.622*	.219	.839**	.774**
WISC Full Scale MA	.649*	.395	.919**	.846**
PPVT MA	.721**	.117	.781**	.461
CMMS MA	.269	.128	.543*	.450

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

measures the subject's "range of information." For white males included in this study, the information subtest correlates at the .05 level or better with WISC Comprehension, WISC Picture Completion, WISC Picture Arrangement, WISC Object Assembly, WISC Verbal MA, WISC Performance MA, and WISC Full Scale MA. The information subtest correlates at the .01 level of confidence with the PPVT MA for white males. For white females, the WISC Information subtest correlates at the .05 level of confidence with only WISC Arithmetic and WISC Verbal MA. One might well question, on the basis of the white females used in this study, that the information subtest correlates significantly with any other test or subtest beyond the level of chance.

For Negro males, the Information subtest correlated at the .05 level or above with all other tests and subtests used for correlation purposes. For Negro females, the same significance level (.05 or above) was found for all other tests and subtests except the PPVT MA and the CMMS MA. From this analysis, one might well assume that the Negro children's "range of information", or lack of it, contributed significantly to the differences in total WISC test results between the two groups (white and Negro).

Table VII presents the correlation coefficients between WISC Comprehension subtest raw scores and fourteen other test scores for the four race-sex groups. Wechsler defines the Comprehension subtest as "a test of common sense" or "a general ability to evaluate past experience" (39:68). For white males, Comprehension correlated at the .05 (or above) level of confidence with WISC Information, WISC Vocabulary,

TABLE VII

CORRELATION COEFFICIENTS BETWEEN WISC COMPREHENSION SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.644*	-.084	.751**	.870**
WISC Arithmetic	-.466	.263	.637*	.746**
WISC Similarities	.251	.253	.843**	.390
WISC Vocabulary	.569*	.245	.762**	.843**
WISC Picture Completion	.678**	.447	.721**	.441
WISC Picture Arrangement	.539*	.328	.455	.545*
WISC Block Design	.233	.376	.565*	.661**
WISC Object Assembly	.684**	.127	.650*	.787**
WISC Coding	.307	.055	.538*	.727**
WISC Verbal MA	.658**	.454	.881**	.887**
WISC Performance MA	.709**	.316	.700**	.853**
WISC Full Scale MA	.753**	.382	.828**	.906**
PPVT MA	.741**	.334	.586*	.360
CMMS MA	-.084	.339	.701**	.623*

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

WISC Picture Completion, WISC Picture Arrangement, WISC Object Assembly, WISC Verbal MA, WISC Performance MA, WISC Full Scale MA, and PPVT MA. On the other hand, white females' Comprehension raw scores did not correlate significantly with any other test scores used for correlation purposes in the study.

Negro males' WISC Comprehension raw scores correlated significantly with WISC Information. WISC Arithmetic, WISC Similarities, WISC Vocabulary, WISC Picture Completion, WISC Block Design, WISC Object Assembly, WISC Coding, WISC Verbal MA, WISC Performance MA, WISC Full Scale MA, PPVT MA and CMMS MA. Negro females' Comprehension raw scores followed much the same pattern as the Negro males, correlating significantly with most of the other test scores used for correlation analysis in the study.

Table VII again seems to indicate that a cultural explanation of differences on test scores of the two racial groups could be predicated on an assumption that a lack of "past experience" on which to base adequate or appropriate "common sense" answers, may well contribute to the reported differences in test scores.

Table VIII presents the correlation coefficients between WISC Arithmetic subtest raw scores and fourteen other test scores for the four race-sex groups. It was noted that while no significant correlations (negative or positive) were recorded for white males, a large number of negative correlations were found. These findings were attributed to the extremely small range of the raw scores for white males (Appendix F) and the possible changes in rank of these scores as compared to rank position on other subtests. White females' Arith-

TABLE VIII

CORRELATION COEFFICIENTS BETWEEN WISC ARITHMETIC SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	-.383	.616*	.718**	.675**
WISC Comprehension	-.466	.263	.637*	.746**
WISC Similarities	.362	.528*	.702**	.691**
WISC Vocabulary	.068	.576*	.669**	.786**
WISC Picture Completion	-.156	.235	.574*	.299
WISC Picture Arrangement	-.445	.743**	.402	.443
WISC Block Design	.326	.619*	.751**	.633*
WISC Object Assembly	-.339	.756**	.725**	.683**
WISC Coding	-.231	.374	.430	.677**
WISC Verbal MA	.142	.805**	.864**	.929**
WISC Performance MA	-.245	.723**	.745**	.723**
WISC Full Scale MA	-.137	.806**	.846**	.863**
PPVT MA	-.366	.307	.475	.424
CMMS MA	-.071	.559*	.478	.577*

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

metic subtest raw scores correlate significantly with WISC Information, WISC Similarities, WISC Vocabulary, WISC Picture Arrangement, WISC Block Design, WISC Object Assembly, WISC Verbal MA, WISC Performance MA, WISC Full Scale MA and the CMMS MA.

Negro males' Arithmetic raw scores correlate well with most other WISC scores, as do the scores of the Negro females. These correlations, combined with the correlations found for WISC Information (Table I) lead to further speculation as to the possible cause of the obtained differences in WISC scores for the two racial groups. Wechsler, in his writing on the Arithmetic subtest, states:

> Although the influence of education on the individual's ability to answer arithmetical problems lessens the value of the test as a measure of adult intelligence, the effect of the interrelation between the two factors is not entirely negative. It appears that children who do poorly in arithmetic reasoning often have difficulty with other subjects. A number of examiners reported they are sometimes able to diagnose educational abilities on the basis of scores obtained on this test, especially when supplemented by scores obtained on the general Information Test. The combined scores of those two tests frequently furnishes an accurate estimate of the subject's scholastic achievement (39:70).

This statement by Wechsler, interpreted within a cultural frame of reference, would lead to the assumption that the high correlations found for both Negro males and females indicates that educational lag may contribute to the poor comparative showing on WISC intelligence test scores made by the Negro children in this study.

Table IX offers the correlation coefficients between raw scores on the WISC Similarities subtest and fourteen other test scores. Significant correlations were recorded for WISC Block Design, WISC Coding and WISC Full Scale MA for white males. White females' Simi-

TABLE IX

CORRELATION COEFFICIENTS BETWEEN WISC SIMILARITIES SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.081	.133	.700**	.504*
WISC Comprehension	.251	.253	.843**	.390
WISC Arithmetic	.362	.528*	.702**	.691**
WISC Vocabulary	.453	.856**	.674**	.647**
WISC Picture Completion	.375	.469	.503*	.384
WISC Picture Arrangement	-.137	.739**	.404	.261
WISC Block Design	.747**	.464	.630*	.144
WISC Object Assembly	.159	.835**	.643*	.657**
WISC Coding	.100	.784**	.559*	.714**
WISC Verbal MA	.696**	.833**	.894**	.718**
WISC Performance MA	.276	.870**	.660**	.555*
WISC Full Scale MA	.544*	.860**	.815**	.669**
PPVT MA	.426	.240	.576*	.433
CMMS MA	-.044	.681**	.722**	.128

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

larities scores correlated significantly with WISC Arithmetic, Vocabulary, Picture Arrangement, Object Assembly, Coding, Verbal MA, Performance MA and CMMS MA.

Negro males' Similarities raw scores correlated significantly with all other WISC scores except Block Design as well as CMMS MA. Negro females' scores correlated significantly with WISC Information, Arithmetic, Vocabulary, Object Assembly, Coding and the three WISC MA's. Concerning the area of intelligence measured by the Similarities subtest, Wechsler states:

> ... while a certain degree of verbal comprehension is necessary for even minimal performance, sheer word knowledge need only be a minor factor. More important in the individual's ability to perceive the common elements of the terms he is asked to compare and, at higher levels, his ability to bring them under a single concept (39:73).

One may well question, with the high correlations for both Negro groups added to Wechsler's description of the Comprehension subtest, whether a lack of "verbal comprehension" and a culturally based inability to develop a "single concept" orientation might well contribute to the lowered scores of the Negro children as compared to the white children in this study.

Table X represents the correlation coefficients of raw scores on the WISC Vocabulary subtest with fourteen other test scores for the four race-sex groups. As regards the Vocabulary subtest, Wechsler states:

> Contrary to lay opinion, the size of a man's vocabulary is not only an index of his schooling, but also an excellent measure of his general intelligence. Its excellence as a test of intelligence may stem from the fact that the number of words a man knows is at once a

TABLE X

CORRELATION COEFFICIENTS BETWEEN WISC VOCABULARY SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.388	.256	.819**	.812**
WISC Comprehension	.569*	.295	.762**	.843**
WISC Arithmetic	.068	.576*	.669**	.786**
WISC Similarities	.453	.856**	.674**	.647**
WISC Picture Completion	.427	.348	.929**	.315
WISC Picture Arrangement	-.093	.712**	.306	.588*
WISC Block Design	.414	.546*	.619*	.404
WISC Object Assembly	.333	.810**	.603*	.731**
WISC Coding	.397	.756**	.533*	.780**
WISC VIQ MA	.819**	.863**	.865**	.923**
WISC PIQ MA	.379	.876**	.777**	.734**
WISC FSIQ MA	.607*	.860**	.864**	.866**
PPVT MA	.432	.087	.873**	.339
CMMS MA	.347	.708**	.569*	.679**

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

> measure of his learning ability, his fund of verbal information and of the general range of his ideas. The one serious objection that could be raised against it was that a man's vocabulary is necessarily influenced by his educational and cultural opportunities (39:84).

White males' Vocabulary subtest raw scores correlated significantly with only one other WISC subtest, Comprehension, but did correlate highly with both WISC Verbal MA and WISC Full Scale MA. White females' raw scores correlated well with WISC Arithmetic, Similarities, Picture Arrangement, Block Design, Object Assembly, Coding, Verbal MA, Performance MA and Full Scale MA as well as with the CMMS MA.

Negro males' Vocabulary scores correlate significantly with all other test scores except WISC Picture Arrangement, while Negro females test scores correlate well with all other test scores except Picture Completion, Block Design and PPVT MA. An examination of Table X indicates that the Vocabulary subtest, dependent in part upon "educational and cultural opportunities," again indicated that the total WISC test performance of the Negroes may have been lowered by the verbal factors measured by the Vocabulary subtest and correlating significantly for the Negro group with most other WISC scores.

Table XI presents the coefficient correlation between WISC Picture Completion subtest raw scores and fourteen other test scores for the four race-sex groups. Wechsler states that the Picture Completion subtest measures "the ability of the individual to differentiate essential from non-essential details" (39:78).

White males' Picture Completion subtest raw scores correlate significantly with WISC Information, Comprehension, Picture Arrangement, Block Design, Object Assembly, Verbal MA, Performance MA, Full Scale

TABLE XI

CORRELATION COEFFICIENTS BETWEEN WISC PICTURE COMPLETION SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.517*	-.113	.727**	.449
WISC Comprehension	.678**	.447	.721**	.441
WISC Arithmetic	-.156	.235	.574*	.299
WISC Similarities	.375	.469	.503*	.384
WISC Vocabulary	.427	.348	.929**	.315
WISC Picture Arrangement	.539*	.175	.296	.100
WISC Block Design	.569*	.515*	.620*	.544*
WISC Object Assembly	.875**	.549*	.592*	.789**
WISC Coding	.390	.262	.488*	.396
WISC Verbal MA	.576*	.417	.746**	.427
WISC Performance MA	.917**	.589*	.773**	.733**
WISC Full Scale MA	.915**	.561*	.795**	.608*
PPVT MA	.746**	.144	.757**	.294
CMMS MA	.353	.605*	.535*	.000

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

MA and PPVT MA, while white females' scores on Picture Completion correlate (at the .05 level of confidence) only with Block Design, Object Assembly, Performance MA, Full Scale MA and CMMS MA. The Negro sample demonstrates much the same pattern of correlations with Negro males' scores correlating with all other tests and subtests except Picture Arrangement and Negro females' scores correlating with only four other WISC scores. It was noted that while some sexual differences occurred (white and Negro females scores correlating significantly with fewer other scores than white and Negro males) all four race-sex groups' scores correlated significantly with both WISC Performance MA and WISC Full Scale MA. It was further observed that a test of an individual's ability to "differentiate" might well be a measure of an individual's ability to tell which item is "different than the others" as occurs in the CMMS, and yet, only the Negro males' scores and white females' scores on Picture Completion correlated significantly with CMMS MA's, and the Negro females' scores demonstrated no correlation whatsoever between Picture Completion and CMMS MA.

Table XII represents the correlations between WISC Picture Arrangement and fourteen other test scores for the four race-sex groups. According to Wechsler, this test measures more than one aspect of intelligence. He states:

> In the first place, it is the type of test which effectively measures a subject's ability to comprehend and size up a total situation. The subject must understand the whole, must get the "idea" of the story, before he is able to set himself effectively to the task. There is, of course, some trial and error experimentation, but the subject is also called upon to attempt appraisal of the total situation more than in most other tests. Secondly, the subject matter of the test nearly always

TABLE XII

CORRELATION COEFFICIENTS BETWEEN WISC PICTURE ARRANGEMENT SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.602*	.111	.612*	.495*
WISC Comprehension	.539*	.328	.455	.545*
WISC Arithmetic	-.445	.743**	.402	.443
WISC Similarities	.137	.739**	.404	.261
WISC Vocabulary	.093	.712**	.306	.588*
WISC Picture Completion	.539*	.175	.296	.100
WISC Block Design	.133	.552*	.542*	.316
WISC Object Assembly	.731**	.762**	.688**	.386
WISC Coding	.255	.391	.450	.341
WISC Verbal MA	.149	.719**	.472	.535*
WISC Performance MA	.735**	.749**	.748**	.528*
WISC Full Scale MA	.556*	.737**	.634**	.553*
PPVT MA	.530*	.383	.180	.579*
CMMS MA	.061	.540*	.138	.450

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

> involves some human or practical situation. The understanding of these situations more nearly corresponds to what other writers have referred to as "social intelligence." The author, as already indicated, does not believe in such an entity. His point of view is that social intelligence is just general intelligence applied to social situations. Individuals who do fairly well on the Picture Arrangement seldom turn out to be mental defectives, even when they do badly on other tests (39:75-76).

White males' scores on Picture Arrangement correlate significantly with WISC Information, Comprehension, Picture Completion, Object Assembly, Performance MA, Full Scale MA and PPVT MA. White females' scores correlate significantly with three verbal tests and two other performance tests of the WISC subtests as well as with the Verbal MA, Performance MA and Full Scale MA of the WISC. The Negro male and female test score correlations were somewhat more scattered and generally lower; however, all four race-sex groups showed significant correlations between Picture Arrangement scores and WISC Performance and Full Scale MA's.

Table XIII represents the correlation coefficients between raw scores on the WISC Block Design subtest and fourteen other test scores for the four race-sex groups. The Block Design subtest, according to Wechsler, is "a comprehensive measure of non-verbal intelligence" (39:79).

White males' raw scores on the Block Design subtest correlate significantly with WISC Similarities, Picture Completion, Verbal MA, Performance MA and Full Scale MA. White females' scores correlate significantly with WISC Arithmetic, Picture Completion, Picture Arrangement, Object Assembly, Verbal MA, Performance MA, Full Scale MA, PPVT MA and CMMS MA. Negro males Block Design raw scores correlate signifi-

TABLE XIII

CORRELATION COEFFICIENTS BETWEEN WISC BLOCK DESIGN SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.112	.088	.729**	.491
WISC Comprehension	.233	.376	.565*	.661**
WISC Arithmetic	.326	.619*	.751**	.633*
WISC Similarities	.747**	.464	.630*	.144
WISC Vocabulary	.414	.546*	.619*	.404
WISC Picture Completion	.569*	.511*	.620*	.544*
WISC Picture Arrangement	-.133	.552*	.542*	.316
WISC Object Assembly	.438	.660**	.857**	.678**
WISC Coding	.259	.221	.633*	.423
WISC Verbal MA	.577*	.556*	.731**	.590*
WISC Performance MA	.497*	.715**	.888**	.783**
WISC Full Scale MA	.617*	.680**	.853**	.714**
PPVT MA	.332	.526*	.476	.207
CMMS MA	.300	.666**	.465	.478*

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

cantly with all WISC subtest and MA scores, but not with PPVT or CMMS MA's. Negro females' scores correlate significantly with WISC Comprehension, Arithmetic, Picture Completion, Object Assembly and the three WISC MA Scores. It was again noted that all four race-sex groups' raw scores on Block Design were significantly correlated with WISC Verbal MA, WISC Performance MA and WISC Full Scale MA. While one might question Wechsler's definition of the Block Design subtest as a "measure of non-verbal intelligence," he (Wechsler) also states:

> It (Block Design) correlates well with a variety of criterion measures, with total scale score and with most of the subtests of the scale. It also correlates better with Comprehension, Information, and Vocabulary than some of the Verbal tests themselves (39:79).

Table XIV presents the correlation coefficients between WISC Object Assembly subtest raw scores and fourteen other test scores for the four race-sex groups. Although Wechsler writes that "the Object Assembly was included in our test battery after much hesitation" (39:82), and "the test (Object Assembly) correlates poorly with most of the subtests" (39:83), the correlations found in this study compare favorably with other subtest correlations. White males' Object Assembly scores significantly correlate with WISC Information, Comprehension, Picture Completion, Picture Arrangement, Coding, Performance MA and Full Scale MA as well as PPVT MA. White females' raw scores correlate significantly with ten of the total fourteen other test scores used. The only test scores with which there was no significant correlation for the white females' scores were WISC Information and Comprehension and the PPVT MA. The Negro sample of this study show the same significant pattern of correlation on Object Assembly Scores. Negro males' raw scores

TABLE XIV

CORRELATION COEFFICIENTS BETWEEN WISC OBJECT ASSEMBLY SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.597*	.232	.684**	.790**
WISC Comprehension	.684**	.127	.650**	.787**
WISC Arithmetic	-.339	.756**	.725**	.683**
WISC Similarities	.159	.835**	.643*	.657**
WISC Vocabulary	.333	.810**	.603*	.731**
WISC Picture Completion	.875**	.549*	.592*	.789**
WISC Picture Arrangement	.731**	.762**	.688**	.386
WISC Block Design	.438	.660**	.857**	.678**
WISC Coding	.575*	.681**	.475	.829**
WISC Verbal MA	.459	.789**	.739**	.819**
WISC Performance MA	.975**	.935**	.891**	.963**
WISC Full Scale MA	.870**	.900**	.850**	.929**
PPVT MA	.601*	.120	.298	.441
CMMS MA	.449	.803**	.267	.380

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

correlate with all other test scores at a significant level except WISC Coding, PPVT MA and CMMS MA, while Negro females' scores correlate at the .01 level of confidence with all WISC test scores except Picture Arrangement. The Negro females' scores on Object Assembly do not correlate significantly with their PPVT MA or CMMS MA. While Table XIV tends to deny Wechsler's statement of poor correlation found for Object Assembly, he (Wechsler) later states:

> ...examination of the Object Assembly scatter diagrams show that the low correlations it has with other tests, are due primarily to the large deviations of a relatively small and seemingly special group of individuals. This means, perhaps, that the Object Assembly is a poor test only for certain types of individuals. If the test is appraised on the basis of criteria which are not influenced in a marked degree by the atypical individual, its rating is considerably enhanced (39:83).

Table XV demonstrates the correlation coefficients between WISC Coding subtest raw scores and fourteen other test scores for the four race-sex groups. As regards the test, Wechsler states:

> The subject is required to associate certain symbols with certain other symbols, and the speed and accuracy with which he does it serve as a measure of his intellectual ability (39:81).

In this study it was found that white males' raw scores on WISC Coding correlated significantly with WISC Object Assembly and WISC Performance MA as well as CMMS MA, hardly above the level of chance with fifteen test scores intercorrelated. White females' scores correlate significantly with WISC Similarities and Vocabulary in the WISC verbal subtests and with Object Assembly in the performance scales as well as with Verbal, Performance and Full Scale MA's of the WISC. Negro males' scores correlate significantly with WISC Similarities and Vocabulary

TABLE XV

CORRELATION COEFFICIENTS BETWEEN WISC CODING SUBTEST RAW SCORES AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.155	.226	.506*	.787**
WISC Comprehension	.307	-.055	.538*	.727**
WISC Arithmetic	-.231	.374	.430	.677**
WISC Similarities	.100	.784**	.559*	.714**
WISC Vocabulary	.397	.756**	.533*	.780**
WISC Picture Completion	.390	.262	.488	.396
WISC Picture Arrangement	.255	.391	.450	.341
WISC Block Design	.259	.221	.633*	.423
WISC Object Assembly	.575*	.681**	.475	.829**
WISC Verbal MA	.223	.674**	.510*	.784**
WISC Performance MA	.529*	.744**	.681*	.774**
WISC Full Scale MA	.481	.716**	.618*	.809**
PPVT MA	.224	.170	.405	.234
CMMS MA	.555*	.499*	.718**	.537*

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

as well as with Object Assembly scores and the three WISC MA scores. Negro females scores' on Coding represent the highest and most numerous correlations with other test scores of the four race-sex groups. Their scores correlate (at the .01 level of confidence) with all verbal subtests on the WISC, as well as with WISC Object Assembly raw scores and the three MA scores of the WISC. It was further noted that all four race-sex groups' Coding raw scores correlated significantly with the CMMS MA which may provide some clue as to what the CMMS actually measures.

Table XVI presents the correlation coefficients between WISC Verbal MA's and fourteen other test scores for the four race-sex groups. The Verbal MA represents a composite score of the five WISC verbal subtests (Information, Comprehension, Arithmetic, Similarities and Vocabulary). As was observed from the table, the Verbal MA scores correlate significantly with all Verbal subtest scores for all race-sex groups with the exception of white males' scores on the WISC Arithmetic subtest (previously explained in connection with Table VIII, page 48) and white females' scores on the WISC Comprehension subtest. As was also expected, all four race-sex groups' Verbal MA scores correlated significantly with WISC Performance MA and WISC Full Scale MA scores. WISC Verbal MA's also correlated significantly with PPVT MA's (with the exception of white females' scores) and with CMMS MA's (with the exception of white males). The latter correlations indicate that the PPVT and CMMS measure much the same factors as those measured by the WISC Verbal scales.

Table XVII presents the correlation coefficients between WISC

TABLE XVI

CORRELATION COEFFICIENTS BETWEEN WISC VERBAL MA AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.644*	.531*	.893**	.852**
WISC Comprehension	.658**	.454	.881**	.887**
WISC Arithmetic	.142	.805**	.864**	.929**
WISC Similarities	.696**	.833**	.894**	.718**
WISC Vocabulary	.819**	.863**	.865**	.923**
WISC Picture Completion	.576*	.417	.746**	.427
WISC Picture Arrangement	.149	.719**	.472	.535*
WISC Block Design	.577*	.556*	.731**	.590*
WISC Object Assembly	.459	.789**	.739**	.819**
WISC Coding	.223	.674**	.510*	.784**
WISC Performance MA	.550*	.875**	.813**	.835**
WISC Full Scale MA	.784**	.955**	.955**	.959**
PPVT MA	.660**	.275	.734**	.485*
CMMS MA	.160	.687**	.653**	.553*

*Significant at .05 level of confidence.

**Significant at .10 level of confidence.

TABLE XVII

CORRELATION COEFFICIENTS BETWEEN WISC PERFORMANCE MA AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.622*	.219	.839**	.774**
WISC Comprehension	.709**	.316	.700**	.853**
WISC Arithmetic	-.245	.723**	.745**	.723**
WISC Similarities	.276	.870**	.660**	.555*
WISC Vocabulary	.379	.876**	.777**	.734**
WISC Picture Completion	.917**	.589*	.773**	.733**
WISC Picture Arrangement	.735**	.749**	.748**	.528*
WISC Block Design	.497*	.715**	.888**	.783**
WISC Object Assembly	.975**	.935**	.891**	.963**
WISC Coding	.529*	.744**	.681**	.774**
WISC Verbal MA	.550*	.875**	.813**	.835**
WISC Full Scale MA	.932**	.972**	.948**	.957**
PPVT MA	.704**	.237	.573*	.475
CMMS MA	.390	.775**	.473	.459

*Significant at .05 level of confidence.

*Significant at .01 level of confidence.

Performance MA and fourteen other scores for the four race-sex groups. As would be anticipated, Performance MA correlates significantly with WISC Performance subtests for all groups involved, as well as correlating significantly with both Verbal MA and Full Scale MA for the four race-sex groups. For Negro males and females, WISC Performance MA's correlated significantly with all other scores on the WISC.

Table XVIII presents the correlation coefficients between WISC Full Scale MA, a composite score of the total WISC scales, and fourteen other test scores. As expected, the Full Scale MA correlates significantly with most WISC scores for all four of the race-sex groups. The Negro males' and females' WISC Full Scale MA's correlated significantly with all other test scores used for correlation purposes.

Table XIX presents the correlation coefficients between the PPVT MA and fourteen other test scores for the four race-sex groups. White males' PPVT MA's correlated significantly with WISC Information, Comprehension, Picture Completion, Picture Arrangement, Object Assembly and the three WISC MA scores. For the white female group, however, the PPVT MA does not correlate significantly with any other test score except WISC Block Design. The Negro sample demonstrates the same pattern. Negro males' PPVT MA's correlate significantly with WISC Information, Comprehension, Similarities, Vocabulary and Picture Completion raw scores as well as with the three WISC MA's and the CMMS MA. Negro females' PPVT MA's correlate with only WISC Picture Arrangement scores, WISC Verbal MA and WISC Full Scale MA. The author of the PPVT (16) states that his instrument is a measure of "hearing vocabulary." These *r*'s suggest, when coupled with the analysis of variance (Table IV, page

TABLE XVIII

CORRELATION COEFFICIENTS BETWEEN WISC FULL SCALE MA AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.649*	.395	.919**	.846**
WISC Comprehension	.753**	.382	.828**	.906**
WISC Arithmetic	.137	.806**	.846**	.863**
WISC Similarities	.544*	.860**	.815**	.669**
WISC Vocabulary	.607*	.860**	.864**	.866**
WISC Picture Completion	.915**	.561*	.795**	.608*
WISC Picture Arrangement	.556*	.737**	.634*	.553*
WISC Block Design	.617*	.679**	.853**	.714**
WISC Object Assembly	.870**	.900**	.850**	.929**
WISC Coding	.481	.716**	.618*	.809**
WISC Verbal MA	.784**	.955**	.955**	.959**
WISC Performance MA	.932**	.972**	.948**	.957**
PPVT MA	.806**	.275	.701*	.503*
CMMS MA	.365	.763**	.584*	.522*

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

TABLE XIX

CORRELATION COEFFICIENTS BETWEEN PPVT MA AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.721**	.117	.781**	.461
WISC Comprehension	.741**	.334	.586*	.360
WISC Arithmetic	.366	.307	.475	.424
WISC Similarities	.426	.240	.576*	.433
WISC Vocabulary	.432	.087	.873**	.339
WISC Picture Completion	.746**	.144	.757**	.294
WISC Picture Arrangement	.530*	.383	.180	.579*
WISC Block Design	.332	.526*	.476	.207
WISC Object Assembly	.601*	.120	.298	.441
WISC Coding	.224	.170	.405	.234
WISC Verbal	.660**	.275	.734**	.485*
WISC Performance MA	.704**	.237	.574*	.475
WISC Full Scale MA	.806**	.275	.701**	.503*
CMMS MA	.091	.037	.527*	-.068

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

41), that there may have been a sex factor in the PPVT, at least for this sample from this age range.

Table XX presents the correlation coefficients between CMMS MA's and fourteen other test scores for the four race-sex groups. As was stated earlier, some question was presented as to what the CMMS measures. Correlation coefficients, found in this study, provide little or no information in answer to the question. The only significant correlation found between CMMS MA's and all other tests was the correlation with WISC Coding for the white males, and this correlation might well have occurred by chance with fourteen correlations involved in the table. White females' CMMS MA's correlate significantly with WISC Arithmetic, Similarities, Vocabulary, Picture Completion, Picture Arrangement, Block Design, Object Assembly, Coding and the three WISC MA's. Negro males' CMMS MA's correlate significantly with WISC Information, Comprehension, Similarities, Vocabulary, Picture Completion, Coding, WISC Verbal MA, WISC Full Scale MA and PPVT MA. Negro females' CMMS MA's correlate significantly with WISC Comprehension, Vocabulary, Coding, WISC Verbal MA and Full Scale MA. These _r_'s suggest that the CMMS may have a measure of vocabulary and ability to associate symbols or objects. In light of this correlation information, as well as previously presented data analysis, it would appear that this study produced not only the question of what the CMMS measures, but also how well it measures, if it does measure any aspect of general intelligence.

Tables VI through XX have presented correlation coefficients for intercorrelations of fifteen different test scores obtained in this study. Many significant correlations were found for all four

TABLE XX

CORRELATION COEFFICIENTS BETWEEN CMMS MA AND FOURTEEN OTHER TEST SCORES FOR WHITE MALES, WHITE FEMALES, NEGRO MALES AND NEGRO FEMALES

Test	White Males	White Females	Negro Males	Negro Females
WISC Information	.269	.128	.543*	.450
WISC Comprehension	-.084	.339	.701**	.623*
WISC Arithmetic	-.071	.559*	.479	.577*
WISC Similarities	-.043	.681**	.722**	.128
WISC Vocabulary	.347	.708**	.569*	.679**
WISC Picture Completion	.353	.605*	.535*	.000
WISC Picture Arrangement	.061	.540*	.138	.450
WISC Block Design	.300	.666*	.465	.478
WISC Object Assembly	.449	.803**	.267	.380
WISC Coding	.555*	.499*	.718**	.537*
WISC Verbal MA	.160	.687*	.653*	.553*
WISC Performance MA	.390	.775**	.473	.459
WISC Full Scale MA	.365	.763**	.584*	.522*
PPVT MA	.091	.037	.527*	-.068

*Significant at .05 level of confidence.

**Significant at .01 level of confidence.

race-sex groups. The WISC subtest scores and MA scores intercorrelated significantly as might be anticipated; however, some cultural biases were questioned in subtest construction. PPVT MA's were found to correlate well with other test scores for both white and Negro males, but not for white and Negro females, leading to the possible assumption that the sex of a child may influence how well the PPVT may measure hearing vocabulary for this age group. CMMS MA correlations were indicative of some question as to CMMS validity and comparative reliability.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

Summary

The purpose of this study was to examine differences in intelligence test scores between Negro and white children when certain verbal and time factors were varied. In order to vary these verbal and time factors, three standardized, individually administered intelligence tests were used; the Wechsler Intelligence Scale For Children (WISC), the Peabody Picture Vocabulary Test (PPVT), Form B, and the Columbia Mental Maturity Scale (CMMS), 1959 Revision. Examination of related literature provided evidence to indicate that such a study was warranted and that the instruments used were reliable.

Twenty-five Negro children (12 boys and 13 girls) were selected by sex, age, and grade from the Duval Elementary School, Gainesville, Florida. A comparable group of white children was chosen by the same criteria from the Kirby Smith Elementary School, Gainesville, Florida. Both the Negro and white samples were chosen from among those children who had received all of their formal schooling in the Alachua County, Florida, Schools.

Test results of the two racial groups and of the four race-sex groups were analyzed by two statistical techniques, analysis of variance and intercorrelation of test scores by the Pearson Product-

Moment correlation method. Comparisons of mean and median IQ scores for the race-sex and total racial groups were also made in graphic form. For the correlation coefficients obtained and the analysis of variance technique, a five-per cent level of significance was used.

Conclusions

By analyzing the data as described above, certain conclusions were reached with regard to the instruments used and the children included in the study. The WISC appeared to measure more consistently for both the Negro and white children than did the PPVT or CMMS. The PPVT was found to produce significant variances in sex, especially in the Negro sample and some question was raised as to its use with Negro children in this age range (9 years, 6 months to 10 years, 2 months). The CMMS, by comparison of mean and median scores, by analysis of variance data, and by inconsistent correlation coefficients found for the four race-sex groups raised questions as to what the test actually measures that may be common to the white and Negro culture.

The test score differences produced certain information concerning the children used as subjects. A significant difference was found between test scores for the racial groups on all three instruments used; however, significant differences were also found between the sexes (total girls and total boys) and between the sexes within racial groups. Some correlation coefficients found for the four race-sex groups indicated that both race and sex may play a part in the reliability of an intelligence test to measure validly what it is purported to measure. It was also found that school group achievement test scores (obtained for both groups from school records) do not indicate the same differences as those found on intelligence test scores. Negro boys scored slightly higher throughout the intelligence testing (with the exception of WISC Performance IQ) than did the Negro girls; however, the Negro girls outscored the Negro boys on academic achievement test scores obtained from the Stanford Achievement Test, Elementary Battery. Also, the white males scored considerably higher on all intelligence test scores than did white females; however, in school achievement test scores (Stanford Achievement, Elementary Battery) the difference was reduced considerably between the white girls and white boys. Comparison of achievement test score means for the two racial groups indicated the total white sample (boys and girls) were functioning at grade level while the Negro sample (boys and girls) were operating approximately one school year below grade level. Unless predictions are made separately by sex, the usefulness of intelligence test scores as criteria of success in school is limited for children of both races at this age level. It was further concluded that the data from this study support the hypothesis that intelligence test scores may be explained in terms of both biological and cultural terms or in terms of interaction of the two.

Implications

A further stated purpose of this study was to make recommendations, based upon found and examined difference in intelligence test scores as criteria for placing or grouping children or assisting children in making educational and vocational choices.

This study indicates that school psychologists and psychometrists as well as teachers and administrators should recognize that a Negro child scoring at IQ 110 and above may well represent the higher IQ level of his subcultural group, and, conversely, that an IQ of 75 on the WISC or Stanford-Binet may *not* necessarily indicate that a Negro child is a candidate for an educable mentally retarded school class. Mean and median IQ's reported for Negro children in this study would indicate that such an approach to mental retardation is unrealistic in terms of classifying Negro mental retardates on the basis of educational standards for white children.

School counselors should approach with empathic understanding the problems of the Negro child and in all cases where test scores are used, the counselor might well scrutinize test results with an attitude of healthy skepticism and continually assess these test results in terms of what they may mean to the individual child, Negro or otherwise. Both Negro and white counselors should recognize that test results do not in themselves provide sufficient evidence on which to predict or suggest educational and vocational goals and outcomes.

Additional research is indicated in the area of test score differences. Both longitudinal studies of the same nature as this study, and research directed toward causation of found differences, are needed. Item analysis of the WISC when used with a large Negro sample, covering the total elementary school age range might well provide significant information as to causation of lowered test scores not demonstrated in this study. Studies directed to comparisons of equated Negro groups in the segregated and desegregated school setting would contribute to the understanding of demonstrated differences. Larger numbers and more thorough statistical analyses are needed in studies of this nature to develop more adequate justification of the conclusions drawn and recommendations made in this study.

APPENDIX A

Duval Elementary School
2106 N. E. 8th Avenue
Gainesville, Florida

February 20, 1964

Dear Parent:

Your child, __________________________, has been chosen as a possible participant in a doctoral dissertation study which I am conducting in the College of Education, University of Florida. This study is designed to compare test results of Negro and white children. It is my intention to administer three individually administered intelligence tests to your child. This testing will take place at the school, during school hours, and will involve approximately two hours of your child's time. All information obtained will remain strictly confidential. No projective or personality usage will be made of the test results. I am a certified school psychologist in the State of Florida and qualified to administer these tests and interpret the results.

This project has the approval of the Guidance Director for the Alachua County Schools, your principal, Mr. Jackson, and the staff of the Duval Elementary School.

If you are willing to have your child participate in this study, please sign the parental permission form below. You will find a stamped and addressed envelope attached. Please return this form at your earliest convenience.

Thank you,

Lester E. Tuttle, Jr.

L. M. Jackson,
Principal

****

I hereby grant permission for my child to participate in the study outlined above.

____________________ Date

________________________________ Signature

Kirby-Smith Elementary School
619 East University Avenue
Gainesville, Florida

March 30, 1964

Dear Parent:

Your child, __________________________, has been chosen as a possible participant in a doctoral dissertation study which I am conducting in the College of Education, University of Florida. This study is designed to compare test results of Negro and white children. It is my intention to administer three individually administered intelligence tests to your child. This testing will take place at the school, during school hours, and will involve approximately two hours of your child's time. All information obtained will remain strictly confidential. No projective or personality usage will be made of the test results. I am a certified school psychologist in the State of Florida and qualified to administer these tests and interpret the results.

This project has the approval of the Guidance Director for the Alachua County Schools, your principal, Mr. Combs, and the staff of the Kirby-Smith Elementary School.

If you are willing to have your child participate in this study, please sign the parental permission form below. You will find a stamped and addressed envelope attached. Please return this form at your earliest convenience.

Thank you,

Lester E. Tuttle, Jr.

Clement Combs,
Principal

****

I hereby grant permission for my child to participate in the study outlined above.

____________________ Date

______________________________ Signature

APPENDIX B

Personal Data Sheet

1. Assigned No. ____________ 2. Date ____________

3. School ____________ 4. Grade ____________

5. Name ____________ 6. Male ___ Female ___

7. Address ____________ 8. Date of Birth ____________

9. Name of Parent or Guardian ____________

10. Occupation of Parent ____________ 11. SEC ____________

12. Previous test scores:
Test ____________ Type ____________
Scores ____________

13. WISC Results

Verbal	Scaled Score
Information	______
Comprehension	______
Arithmetic	______
Similarities	______
Vocabulary	______
Performance	
Picture Completion	______
Picture Arrangement	______
Block Design	______
Object Assembly	______
Coding	______

VIQ ______ MA ______

PIQ ______ MA ______

FSIQ ______ MA ______

14. CMMS Results
MA ______
IQ ______

15. PPVT Results
MA ______
IQ ______
Percentile ______

COMMENTS: ____________

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APPENDIX C

STANFORD ACHIEVEMENT TEST SCORES FOR THE NEGRO SAMPLE

Test Number	Grade	Paragraph Meaning	Word Meaning	Average Reading	Spelling	Language	Arithmetic Reasoning	Arithmetic Comprehension	Arithmetic Average	Battery Median
A-1-B	4.2	2.3	3.2	.27	2.9	2.0	2.2	2.7	2.4	2.5
A-2-B	4.2	3.0	2.3	2.6	2.6	1.4	3.3	3.3	3.3	2.8
A-3-B	4.2	2.5	2.7	2.6	2.1	1.0	2.7	3.3	3.0	3.0
A-4-B	4.2	5.0	4.9	5.0	6.3	7.3	4.3	3.9	4.1	5.0
A-5-B	4.2	2.0	2.0	2.0	1.4	0	2.2	2.6	2.4	1.7
A-6-B	4.2	4.6	3.9	4.3	4.2	7.1	4.2	3.7	3.9	4.2
A-7-B	4.2	4.8	4.4	4.6	3.3	7.1	4.3	3.4	3.9	4.5
A-8-B	4.2	1.7	2.4	2.1	1.7	0	1.8	2.6	2.2	1.7
A-9-B	4.2	2.3	2.8	2.5	2.9	1.5	2.3	3.0	2.6	2.5
A-10-B	4.2	4.6	3.9	4.3	4.7	6.0	4.0	4.0	4.0	4.3
A-11-B	3.2	1.5	1.5	1.5	1.4	--	1.8	2.3	2.0	1.8
A-12-B	4.2	2.9	2.2	2.6	2.1	0	2.2	3.3	2.8	2.1
AB MEAN*	4.2	3.2	3.1	3.2	3.1	3.0	3.0	3.2	3.1	3.1
A-13-G	4.2	2.3	1.8	2.1	0	0	1.5	1.5	1.5	1.1
A-14-G	4.2	3.2	4.1	3.7	3.8	5.7	2.9	3.1	3.0	3.7
A-15-G	4.2	3.4	3.5	3.5	4.9	5.8	3.8	4.2	3.9	4.0
A-16-G	4.2	2.0	2.8	2.4	2.8	0	1.8	2.8	2.4	2.0
A-17-G	4.2	4.3	3.1	3.7	3.5	2.4	2.2	3.3	2.7	3.2
A-18-G	4.2	3.6	3.5	3.5	3.0	2.0	3.3	3.1	3.2	3.2
A-19-G	4.2	6.3	4.2	5.3	5.7	7.6	4.2	3.6	3.9	5.0
A-20-G	4.2	2.8	2.6	2.7	2.4	3.4	3.1	3.3	3.2	2.9
A-21-G	4.2	2.9	3.0	3.0	3.4	4.5	3.5	3.5	3.5	3.4
A-22-G	4.2	3.3	3.4	3.7	3.4	5.8	4.2	2.4	3.3	3.4
A-23-G	3.2	2.0	1.5	1.7	2.0	--	1.2	2.0	1.6	2.0
A-24-G	4.2	3.4	3.6	3.5	3.8	4.3	3.6	3.8	3.7	3.8
A-25-G	4.2	3.7	4.1	3.9	4.5	7.2	4.5	3.8	4.2	4.3
AG MEAN*	4.2	3.4	3.3	3.4	3.4	4.0	3.2	3.2	3.2	3.3
SCHOOL A MEAN	4th	3.3	3.2	3.3	3.2	3.5	3.1	3.2	3.1	3.2
	3rd	1.7	1.5	1.6	1.7	--	1.7	2.1	1.8	1.9

*Fourth grade only

STANFORD ACHIEVEMENT TEST SCORES FOR THE WHITE SAMPLE

Test Number	Grade	Paragraph Meaning	Word Meaning	Average Reading	Spelling	Language	Arithmetic Reasoning	Arithmetic Comprehension	Arithmetic Average	Battery Median
B-1-B	4.2	5.9	5.3	5.6	4.7	4.5	5.6	5.0	5.3	5.2
B-2-B	4.2	3.7	4.9	4.3	4.1	3.8	4.7	4.2	4.5	4.1
B-3-B	4.2	4.4	5.1	4.8	4.2	5.3	5.2	3.8	4.5	4.8
B-4-B	4.2	4.2	4.9	4.5	4.6	6.0	3.7	4.3	4.0	4.5
B-5-B	4.2	4.0	3.7	3.9	3.8	3.3	3.7	3.5	3.6	3.7
B-6-B	4.2	4.4	6.0	5.2	4.2	4.6	4.5	4.2	4.4	4.5
B-7-B	4.2	5.0	4.6	4.8	5.3	6.0	3.6	4.0	3.8	4.8
B-8-B	4.2	2.5	3.3	2.9	3.0	1.0	3.1	2.8	2.9	2.9
B-9-B	4.2	3.5	2.8	3.1	3.1	1.8	3.0	3.1	3.1	3.0
B-10-B	4.2	5.6	5.6	5.6	4.1	6.5	4.5	4.4	4.5	5.1
B-11-B	3.2	2.1	2.3	2.2	2.6	--	2.5	3.1	2.8	2.5
B-12-B	4.2	6.7	4.3	5.5	6.2	5.3	4.7	3.8	4.3	5.0
BB MEAN*	4.2	4.5	4.5	4.5	4.3	4.3	4.2	3.9	4.0	4.3
B-13-G	4.2	3.9	3.9	3.9	3.5	2.9	4.2	4.4	4.3	3.9
B-14-G	4.2	4.4	4.0	4.2	4.6	4.2	3.8	3.8	3.8	4.1
B-15-G	4.2	4.3	4.1	4.2	4.4	4.4	4.1	4.1	4.1	4.2
B-16-G	4.2	3.6	3.6	3.6	3.8	4.0	2.9	4.2	3.5	3.7
B-17-G	4.2	4.2	4.6	4.4	4.7	5.3	5.1	4.3	4.7	4.6
B-18-G	4.2	2.2	3.2	2.7	2.6	1.2	2.5	2.9	2.7	2.6
B-19-G	4.2	6.3	6.1	6.2	6.0	6.4	5.1	6.1	5.6	6.1
B-20-G	4.2	4.6	3.1	3.9	3.8	5.7	4.0	4.0	4.0	4.0
B-21-G	4.2	4.0	3.8	3.9	4.1	2.8	4.5	4.5	4.5	4.1
B-22-G	4.2	5.7	4.4	5.1	4.4	3.6	4.9	4.4	4.7	4.4
B-23-G	3.2	2.2	2.3	2.3	2.7	--	3.0	3.1	3.1	2.7
B-24-G	4.2	3.6	2.7	3.1	3.8	4.5	3.9	4.2	4.0	3.8
B-25-G	4.2	4.1	3.5	3.8	4.5	4.2	4.2	4.2	4.2	4.2
BG MEAN*	4.2	4.2	3.9	4.0	4.1	4.1	4.1	4.2	4.1	4.1
SCHOOL	4th	4.3	4.2	4.3	4.2	4.2	4.1	4.0	4.1	4.2
B MEAN	3rd	2.1	2.3	2.2	2.6	--	2.7	3.1	2.9	2.6

*Fourth grade only

APPENDIX D

FAMILIAL INFORMATION OBTAINED FROM SCHOOL RECORDS FOR THE NEGRO SAMPLE

Test Number	Sibling Position in Family	Occupation of Mother	Occupation of Father	Educational Level of Mother	Educational Level of Father	Own Home	Teacher's Assessment of Socioeconomic Class
A-1-B	3rd of 4	Maid	Dry Cleaner	9th	10th	Yes	M
A-2-B	4th of 5	Maid	Truck Driver	7th	5th	No	L
A-3-B	Only Child	Maid	Minister	8th	6th	Yes	M
A-4-B	1st of 4	H.W.	Lab. Asst.	10th	11th	No	L
A-5-B	11th of 11	H.W.	Unknown	5th	?	Yes	H
A-6-B	3rd of 3	Lunchroom Asst.	Cook	12th	12th	Yes	M
A-7-B	2nd of 5	H.W.	Unskilled Labor	9th	12th	No	M
A-8-B	2nd of 2	Cook	Janitor	J.C.	7th	Yes	M
A-9-B	6th of 6	H.W.	Cook	7th	6th	Yes	M
A-10-B	1st of 2	H.W.	Attendent Hosp.	4th	9th	Yes	M
A-11-B	3rd of 7	Cook	Unknown	7th	?	No	L
A-12-B	4th of 4	Maid	Bull Dozer Opr.	8th	12th	Yes	M
A-13-G	Oldest of 2	Maid	Pulpwood Worker	8th	2nd	No	L
A-14-G	2nd of 3	Teacher-Sunland	Teacher- H.S.	B.S.	M.A.	Yes	H
A-15-G	1st of 2	Maid	Teacher	11th	B.S.	No	M
A-16-G	4th of 4	Maid	Construction	4th	6th	Yes	M
A-17-G	6th of 7	Maid	Construction	7th	11th	Yes	M
A-18-G	3rd of 4	Maid	Musician	7th	10th	Yes	M
A-19-G	1st of 6	H.W.	Janitor	12th	10th	Yes	M
A-20-G	4th of 5	Maid	Common Labor	10th	4th	No	M
A-21-G	7th of 8	H.W.	Unknown	4th	?	No	L
A-22-G	5th of 7	H.W.	Common Labor	12th	9th	No	L
A-23-G	6th of 7	Maid	General Labor	11th	6th	No	L
A-24-G	2nd of 2	Maid	Unknown	8th	?	No	M
A-25-G	4th of 8	Maid	Unknown	6th	?	No	M

FAMILIAL INFORMATION OBTAINED FROM SCHOOL RECORDS FOR THE WHITE SAMPLE

Test Number	Sibling Position in Family	Occupation of Mother	Occupation of Father	Educational Level of Mother	Educational Level of Father	Own Home	Teacher's Assessment of Socioeconomic Class
B-1-B	3rd of 4	Cafeteria	Post Office	11th	10th	Yes	M
B-2-B	Oldest of 4	H.W.	Machinist	12th	12th	Yes	M
B-3-B	Only Child (2 half bros.)	H.W.	Jeweler	N.A.	N.A.	Yes	M
B-4-B	4th of 4	Secretary	Divorced	12th	N.A.	Yes	M
B-5-B	2nd of 2	H.W.	Auto Mechanic	12th	12th	Yes	M
B-6-B	Oldest of 2	Beautician	Food Service	12th	10th	No	M
B-7-B	Oldest of 4	H.W.	Nurses Asst.	J.C.	12th	Yes	L
B-8-B	5th of 5	H.W.	Painter	10th	9th	Yes	L
B-9-B	Oldest of 3	H.W.	N.A.	10th	7th	No	L
B-10-B	2nd of 2	Clerk	Clerk-Student	12th	J.C.	No	M
B-11-B	8th of 8	H.W.	Construction	11th	8th	No	L
B-12-B	Middle of 3	H.W.	Teacher - Univ.	B.A.	B.A.	Yes	M
B-13-G	4th of 5	H.W.	Linotype Opr.	6th	9th	Yes	L
B-14-G	Middle of 3	Teacher	Sporting Goods	B.A.	B.A.	Yes	M
B-15-G	2nd of 3	H.W.	Machinist	12th	12th	Yes	M
B-16-G	4th of 4	Laundry Clerk	Disabled	10th	12th	Yes	M
B-17-G	Oldest of 3	H.W.	Station Mgr.	12th	12th	Yes	M
B-18-G	4th of 6	H.W.	Unemployed	8th	6th	No	L
B-19-G	Middle of 3	P.B.X. Opr.	Photographer	12th	12th	No	M
B-20-G	2nd of 2	Secretary	Surveyor	12th	12th	Yes	M
B-21-G	2nd of 2	H.W.	Plasterer	10th	12th	Yes	M
B-22-G	Only Child	Cashier	Foreman (Divorced)	12th	11th	Yes	M
B-23-G	3rd of 3	Waitress	Plumber	9th	8th	No	M
B-24-G	3rd of 3	Nurse	Contractor	N.T.	12th	Yes	M
B-25-G	3rd of 4	H.W.	Carpenter	10th	11th	Yes	M

APPENDIX E

INTELLIGENCE TEST SCORES AND MEANS FOR THE NEGRO SAMPLE

Test Number	Chronological Age	WISC			PPVT			CMMS	
		VIQ	PIQ	FSIQ	MA	IQ	%-ile	MA	IQ
A-1-B	9-7	76	87	80	7-3	77	5	6-1	63
A-2-B	9-11	95	78	85	6-10	74	3	7-0	71
A-3-B	9-7	108	93	101	8-4	87	23	8-4	87
A-4-B	9-10	100	85	92	10-9	108	71	7-4	75
A-5-B	10-1	67	67	64	7-5	79	7	8-1	80
A-6-B	9-8	96	92	93	8-11	92	28	7-8	79
A-7-B	10-1	114	101	109	11-0	111	80	8-4	83
A-8-B	9-6	79	72	73	5-4	59	1	7-1	75
A-9-B	9-8	87	100	93	6-8	72	2	6-2	64
A-10-B	9-6	115	113	115	8-2	85	20	8-9	92
A-11-B*	9-9	63	60	58	5-10	64	1	6-1	63
A-12-B	9-9	97	85	91	8-4	87	23	6-9	69
Boys Mean	9-8	91.4	86.1	87.8	7-11	82.9	13+	7-4	75.1
A-13-G	9-11	56	60	54	5-4	59	1	5-11	60
A-14-G	9-6	92	97	94	7-0	76	4	6-2	65
A-15-G	10-0	94	86	89	5-11	66	1	9-1	91
A-16-G	9-7	71	86	76	5-8	63	1	7-4	77
A-17-G	9-11	89	111	98	6-6	71	1	7-3	73
A-18-G	9-10	85	86	84	10-5	105	63	6-4	64
A-19-G	10-0	100	99	99	8-2	85	20	6-4	64
A-20-G	10-0	75	82	76	6-6	71	1	7-11	79
A-21-G	9-11	89	83	85	6-2	68	1	6-8	67
A-22-G	10-1	101	94	98	7-0	76	4	8-1	80
A-23-G*	9-8	65	55	56	3-11	41	1	6-5	65
A-24-G	9-10	99	90	94	8-2	85	20	8-6	87
A-25-G	9-10	105	106	106	6-2	68	1	10-0	102
Girls Mean	9-10	86.3	87.3	85.3	6-6	71.8	1+	7-5	74.9
School Mean	9-9	88.7	86.7	86.5	7-3	77.2	5+	7-4	75.0

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*Third grade, all others fourth grade.

+Percentile rank on PPVT was derived by using the mean mental age as the base for obtaining the corresponding percentile rank from tables provided in the manual.

INTELLIGENCE TEST SCORES AND MEANS FOR THE WHITE SAMPLE

Test Number	Chronological Age	WISC			PPVT			CMMS	
		VIQ	PIQ	FSIQ	MA	IQ	%-ile	MA	IQ
B-1-B	9-6	104	100	102	11-0	111	80	7-6	79
B-2-B	9-10	123	104	115	10-2	101	51	7-6	76
B-3-B	9-7	115	104	111	11-3	113	82	9-4	97
B-4-B	9-10	121	125	125	11-11	116	87	10-0	102
B-5-B	9-10	108	97	103	10-10	110	75	8-9	89
B-6-B	9-9	118	114	117	11-0	111	80	12-3	125
B-7-B	10-1	124	118	123	14-2	132	96	8-1	80
B-8-B	9-6	111	100	107	11-3	113	82	7-6	77
B-9-B	9-9	110	111	112	10-2	101	51	9-4	96
B-10-B	9-6	131	140	138	16-10	145	99	9-1	96
B-11-B*	9-8	103	113	108	9-1	93	30	8-1	84
B-12-B	9-9	118	86	103	10-4	103	58	7-4	75
Boys Mean	9-8	115.5	109.3	113.7	11-6	112.4	80+	8-8	89.7
B-13-G	9-11	100	92	96	9-1	93	30	7-6	76
B-14-G	9-6	110	121	117	10-5	105	63	11-6	121
B-15-G	10-0	97	85	91	10-10	110	75	7-11	79
B-16-G	9-6	97	99	98	9-4	95	34	7-8	81
B-17-G	9-11	124	127	128	10-10	110	75	10-5	105
B-18-G	9-10	90	79	83	9-10	98	43	7-4	74
B-19-G	10-1	104	107	106	10-4	103	58	7-11	78
B-20-G	10-1	104	108	107	8-6	89	25	11-1	110
B-21-G	9-11	101	101	101	8-4	87	23	7-11	80
B-22-G	10-1	101	100	101	10-10	110	75	7-2	71
B-23-G*	9-8	87	78	81	9-1	93	30	6-6	67
B-24-G	9-9	108	90	99	9-1	93	30	8-6	87
B-25-G	9-10	95	86	90	10-4	103	58	7-0	71
Girls Mean	9-10	101.4	97.9	99.9	9-9	99.2	43+	8-4	84.6
School Mean	9-9	108.2	103.4	106.5	10-7	105.5	63+	8-6	87.0

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*Third grade, all others fourth grade.

+Percentile rank on PPVT was derived by using the mean mental age as the base for obtaining the corresponding percentile rank from tables provided in the manual.

APPENDIX F

TEN WISC SUBTEST RAW SCORES AND FIVE MENTAL AGE TEST SCORES USED TO OBTAIN CORRELATION COEFFICIENTS FOR THE NEGRO SAMPLE

Test Number	Information	Comprehension	Arithmetic	Similarities	Vocabulary	Picture Completion	Picture Arrangement	Block Design	Object Assembly	Coding	WISC Verbal MA*	WISC Performance MA*	WISC Full Scale MA*	PPVT MA	CMMS MA
A-1-B	11	8	3	4	21	10	23	5	15	26	87	100	92	87	73
A-2-B	11	12	8	8	20	9	24	2	14	23	113	93	101	82	84
A-3-B	12	12	9	11	26	11	15	10	17	29	125	107	115	100	100
A-4-B	13	10	9	6	31	13	4	9	12	23	118	100	109	129	88
A-5-B	7	9	3	5	20	10	4	0	5	34	81	81	77	89	97
A-6-B	13	9	9	6	27	11	23	4	11	32	111	107	108	107	92
A-7-B	16	14	10	11	33	12	26	14	18	40	137	122	132	132	100
A-8-B	9	9	7	4	17	9	4	3	11	26	90	82	83	64	85
A-9-B	10	9	9	5	22	11	26	12	19	30	100	116	108	80	74
A-10-B	14	12	12	10	29	12	26	19	23	41	131	129	131	98	105
A-11-B	7	4	5	4	9	5	6	2	6	23	73	70	68	70	73
A-12-B	10	10	9	8	30	11	7	5	16	29	114	99	105	100	81
A-13-G	5	3	3	1	10	5	8	3	7	13	66	71	64	64	71
A-14-G	12	12	7	6	18	10	6	10	19	43	105	111	107	84	74
A-15-G	13	12	7	7	30	7	19	4	17	48	113	103	107	71	109
A-16-G	8	7	4	5	16	12	6	4	16	32	81	98	87	68	88
A-17-G	12	12	7	4	21	14	20	18	21	36	106	128	117	78	87
A-18-G	11	8	7	6	18	10	19	8	16	25	100	101	99	125	76
A-19-G	11	9	10	17	25	11	18	6	21	50	120	117	119	98	76
A-20-G	10	8	6	5	18	8	20	5	15	38	90	98	91	78	95
A-21-G	10	10	7	7	23	11	13	5	16	25	106	98	101	74	80
A-22-G	12	11	11	10	26	11	8	11	20	44	122	114	118	84	97
A-23-G	8	4	5	3	11	6	2	2	7	20	75	64	65	47	77
A-24-G	11	13	10	6	25	7	25	8	14	33	117	106	111	98	102
A-25-G	11	13	12	8	26	10	17	21	21	45	124	125	125	74	120

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*MA's were obtained by using The Bowman IQ KAlculator. Personnel Press, Inc. Princeton, New Jersey, 1957.

TEN WISC SUBTEST RAW SCORES AND FIVE MENTAL AGE TEST SCORES USED TO OBTAIN CORRELATION COEFFICIENTS FOR THE WHITE SAMPLE

Test Number	Information	Comprehension	Arithmetic	Similarities	Vocabulary	Picture Completion	Picture Arrangement	Block Design	Object Assembly	Coding	WISC Verbal MA*	WISC Performance MA*	WISC Full Scale MA*	PPVT MA	CMMS MA
B-1-B	15	10	9	8	24	10	32	5	19	34	118	114	116	132	90
B-2-B	18	13	11	10	39	11	27	12	21	32	145	122	128	124	90
B-3-B	17	11	9	10	33	13	28	8	21	28	132	119	127	135	112
B-4-B	14	11	12	18	37	17	25	32	25	39	143	145	147	143	120
B-5-B	14	11	9	8	37	12	8	18	20	35	127	114	121	130	117
B-6-B	18	10	10	11	39	12	28	19	23	38	138	133	136	132	145
B-7-B	18	16	8	18	41	15	31	26	25	37	150	143	149	170	97
B-8-B	13	10	10	12	31	10	28	10	19	31	126	114	122	135	90
B-9-B	13	13	9	8	40	13	31	6	23	41	128	130	131	122	112
B-10-B	21	16	9	12	41	19	47	18	27	34	149	160	157	202	109
B-11-B	13	11	10	8	27	13	32	18	23	29	119	131	125	109	97
B-12-B	12	10	12	16	39	10	4	18	15	27	138	100	120	124	88
B-13-G	13	10	9	8	27	8	21	5	17	42	119	109	114	109	90
B-14-G	12	11	10	10	33	11	28	40	24	39	125	138	133	125	138
B-15-G	12	13	10	7	24	9	19	23	17	20	116	101	109	130	95
B-16-G	12	10	9	6	24	12	17	14	20	28	110	112	112	112	92
B-17-G	13	16	11	15	38	12	43	25	25	45	147	151	152	130	125
B-18-G	11	11	6	7	22	10	3	5	13	33	106	93	98	118	88
B-19-G	13	8	9	13	33	10	27	20	23	47	126	129	128	124	95
B-20-G	12	9	10	13	32	10	35	12	26	45	126	130	129	102	133
B-21-G	12	11	9	8	30	9	20	16	19	42	120	120	120	100	95
B-22-G	14	9	11	9	28	7	34	18	21	38	122	121	122	130	86
B-23-G	9	10	6	6	27	7	21	4	14	27	100	90	88	109	78
B-24-G	17	10	10	7	30	8	16	10	18	34	126	105	116	109	102
B-25-G	13	9	8	7	25	8	21	8	15	27	112	101	106	124	84

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*MA's were obtained by using The Bowman IQ KAlculator. Personnel Press, Inc. Princeton, New Jersey, 1957.

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BIOGRAPHICAL SKETCH

Lester Eugene Tuttle, Jr. was born July 23, 1924 at Springfield, Ohio. His undergraduate work was taken at Wittenberg University, Springfield, Ohio, where he received a Bachelor of Science degree. His graduate work was taken at Pittsburgh University, Pittsburgh, Pennsylvania, where he received a Master of Education degree in secondary education administration.

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This dissertation was prepared under the direction of the chairman of the candidate's supervisory committee and has been approved by all members of that committee. It was submitted to the Dean of the College of Education and to the Graduate Council, and was approved as partial fulfillment of the requirements for the degree of Doctor of Education.

December, 1964

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